HOROLOGICAL TIMES™

ADVANCING THE ART, SCIENCE & BUSINESS OF HOROLOGY

MAY 2011

ISSUE highlights

AMERICAN WATCHMAKERS-
CLOCKMAKERS INSTITUTE

This Month's Focus: *Technical Spotlight*

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Winding Intermediate Wheel Post Repair, Part 1

An Update: Battery Industry's Move to 0% Mercury

The Quartz Watch With a Mechanical Tick

The 21st Century Workshop: Hayes Jewelers

Two Terrific New Watch Part Solutions

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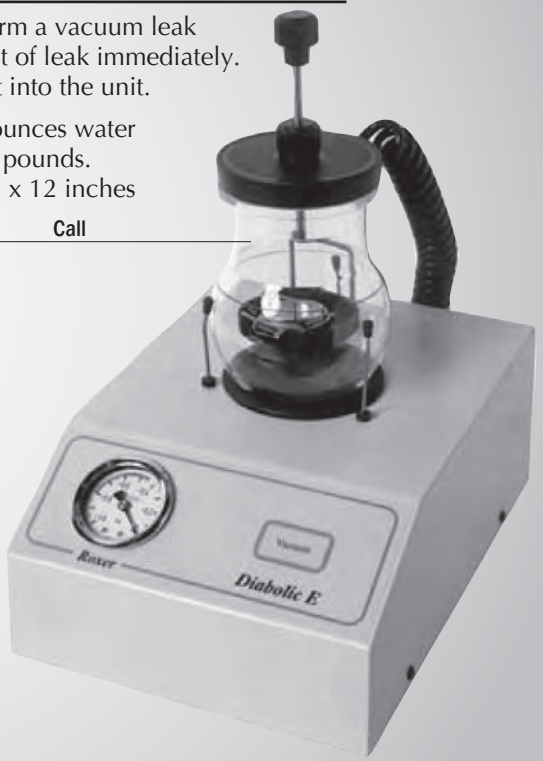

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BY MARK BUTTERWORTH

By now, if you have read my messages over the past few months (poor souls), you know I try to have some type of theme or message. It may not speak directly to what is happening at AWCI, however, our Executive Director, Jim Lubic, does a fine job of that. But I try to write about something that is helpful to our lives as horologists, and to our lives from a personal standpoint.

Time is one of the most precious, diminishing resources in our lives, and we need to use it wisely. I firmly believe that we should strive to work smarter, not harder. The other thing we need to use wisely is *money*. I was raised in a pretty conservative family and religion, and I was taught that waste is sinful. It's especially bad to squander time and money, both of which are finite assets for which we are responsible.

I would like to write a few words about finances—AWCI's and our own, both personally and as business professionals. By the time you read this, AWCI will be starting our budget planning process for the upcoming fiscal year which starts July 1st. Our current budget is available to all members on the web. We welcome your input as members of AWCI and want to know your priorities on spending. We would also like your input on how we should procure income.

In general terms, there is good news and bad news in the organization. AWCI is like a person who reaches retirement age with a nice nest egg. But, in an economic environment in which interest rates are at historic lows, the income from investments is not as large as hoped. Our nest egg is the Perpetuation Fund, which is worth roughly $7 million. Financially, we are strong—thanks partially to hard work and sacrifice on the part of our staff. We also have a constitution that has kept us from spending away all our capital, plus a conscientious Board of Directors and watchful fund trustees. However, like the retiree, we have lived through a stock market drop of over 50% and a period of almost non-existent interest rates. Since the income from the fund represents close to 30 to 35% of our entire income, these past several years have been challenging. This is why we constantly remind folks that, as an organization, we are financially very strong, but at the same time, we have to work very hard to maintain a balanced budget. If interest rates were at normal levels, we would be in fat city. Ultimately, interest rates will go up again, and so should the income from the fund.

So, there is a debate. Do we spend some of the capital now to do what we feel is necessary to offer our members what they want? Or, do we try to make compromises to maintain our current capital level? According to our constitution, this is something only our members can decide.

It's important to know, at this point, we have not spent our capital.

During the past several years, members of the Industry Advisory Board (IAB) have been very helpful financially. This year alone, the Rolex Challenge Grant has raised approximately $48,000. Most of this money will go towards upgrading our watch classroom. The classroom will be absolutely state-of-the-art electronically within a few months. Money from previous years has already been used to purchase new benches and equipment. I strongly encourage watchmakers to come and take advantage of our facilities and our great instructor, Tom Schomaker.

On a personal level, I have seen both positive and negative financial indicators over the past year. I believe our industry hit bottom several months ago. Repair is picking up again very strongly. However, the level of debt among some of our customers is a concern. We see it each time a credit card is declined, and many folks have multiple credit cards that need switched with each order. My greatest concern is, I have seen this issue with both older and younger customers.

We have gone through some tough times, and I am thankful that we have a trade which is in demand. I challenge each person to try to reduce their debt level this year. We will all sleep better for it. After all, as Benjamin Franklin once said, "a penny saved is a penny earned."

a message from the executive director

This month I think it's important to highlight all the technical service benefits AWCI can provide to you, our members. Presently, we have 563 members subscribed to our online Technical Discussion and Parts Forum. If you aren't familiar with this forum, it's located on our website at www.awci.com. On the left side of our home page is a blue box with our most popular links. The Technical Discussion and Parts Forum is the third link listed in this area. When you click on this link, you will be taken to the forum. Once there, you'll see three separate forums: one for watches, one for clocks, and a third forum for tools. First, you must subscribe by providing a user name, e-mail address, and your AWCI membership number. Subscriptions are approved on the same day in most cases. Once your subscription is approved, you are free to participate in any of these three forums.

These forums are a great way to get answers to questions you may have from your peers or customers. You can:

- Find sources for parts.
- Discuss that new technique you've just seen.
- Ask questions of your peers.
- Look for that oldie-but-goodie tool you'd like to locate.

Quite simply, our forums are a good way to network and get to know your fellow AWCI members.

If you aren't successful getting the answers you need on the forum by all means, contact AWCI. Sally Landis is the front line in our Technical Support services. Sally can be reached toll-free at 1-866-FOR-AWCI (866-367-2924) extension 301 or by e-mail at: slandis@awci.com. If Sally isn't able to answer your question or get the information you're looking for, she will give your question to either Tom Schomaker or myself. If Tom or I aren't able to find your answer we will publish the request in the Bulletin Board section of *HT*.

Most of our technical guides are available in electronic format. These can be e-mailed to you usually on the same day, and in most cases, within the hour. If we research a question, we will usually scan our research and e-mail it for you, too. If you aren't able to take advantage of e-mail we are still willing to fax, and if you aren't able to receive faxes, we are happy to use the U.S. postal service.

We are in the process of developing a new website for the Institute. We hope to have it up and running by our Annual Convention and Educational Symposium which will take place August 3rd through the 7th in Vancouver, Washington, near Portland, Oregon. When the new site is available, everything we have in electronic format will be available directly to our members in the member-protected area.

Be sure to take advantage of your AWCI membership. If you want to know the answer to something technical, don't be shy. We are here to help you in all aspects of your watchmaking and clockmaking career. Working together, we can all help *Advance the Art, Science and Business of Horology.*

P.S. We would like to announce that Herman Mayer has agreed to become our new Education Committee Chairman. Herman is the principal of Lititz Watch Technicum and is also the director of SAWTA. Assisting Herman will be Michael Gainey as Clock Section Head and Manuel Yazijian, our Watch Section Head. We'd like to thank these professionals—and all our valued committee members—for providing a valuable service to the industry.

Honor Awards Nominations

The Honor Awards Committee would like your help in finding applicants who fulfill the requirements for the achievement awards given out at the AWCI Convention and Educational Symposium held in August. The awards are:

AWCI Fellow Award

This is AWCI's most prestigious award. It carries the endorsement of one's peers as an outstanding member of the Horological Community. The person must have these qualities:

- Tangible evidence of leadership abilities
- Active participation chairing or serving on committees
- Publication of articles in horological publications
- Given lectures, workshops and technical demonstrations

Outstanding Achievement Award

Recognized for outstanding personal achievements or accomplishments such as projects, inventions, or innovative or creative ideas that meet a need in the field of Horology.

Meritorious Service Award

Awarded to a person who has made a significant contribution to AWCI and its members.
Please complete the form and send to:

Honor Awards Committee Chairperson, c/o Tom Pack, AWCI, 701 Enterprise Dr., Harrison, OH 45030.
Or, e-mail the Honor Awards Committee at: tpack@awci.com with any questions or completed form.

Honor Awards Committee

Chair	Michael Gainey, CC21
Member	Glenn Gardner, CMW
	Wes Door, CMW, FAWI
Staff Contact	Thomas Pack, CPA

HONOR AWARDS NOMINATION FORM

Date Submitted: _____

Nominee Name: _____

Nominated for (check one):

❑ AWCI Fellow Award ❑ Outstanding Achievement ❑ Meritorious Service

Years of continuous AWCI membership, if known: _____

Chapter Memberships: _____

_____

Offices held:

Local _____

National _____

International _____

Participation on committees, chairmanships and other leadership roles:

Local _____

National _____

International _____

Publications, books, magazine articles, newspaper articles and other works promoting Horology and AWCI:

Chapter _____

Horological _____

Other pertinent publications _____

Lectures, workshops, seminars and other activities and goals advancing the study of Horology: _____

Awards and recognition received for activities related to Horology:

_____

_____

Nominated by: Name _____

Address _____

City _____ State _____ Zip _____

Phone _____ E-mail _____

SEND FORM TO: Tom Pack, AWCI, 701 Enterprise Dr., Harrison, OH 45030

Fax: 513-367-1414 E-mail: tpack@awci.com

An Update: Battery Industry's Move to 0% Mercury

Button Cells Last Remaining in Move to Zero Mercury Added

Your Environment Health & Safety

BY AMY DUNN

Horological Times featured an article on the battery industry's move to 0% mercury in our January 2011 issue. Since that time, there is more industry activity to report. What has instigated these industry changes? On July 1, 2011 the states of Connecticut, Rhode Island and Maine will ban the sale of all button-cell batteries containing added mercury. Any equipment using these batteries, such as watches, electronics and hearing aids, must have the old-style batteries replaced before they can be sold. At least 30 other states plus Canada are also considering a mercury-added ban on button-cell batteries. These "specialty" batteries are the last type of battery where mercury is used in the manufacturing process. The current and potential bans are forcing the entire battery industry to respond with new button-cell products.

As noted in the prior article, Renata had already switched all product lines to 0% mercury-added manufacturing. Now, Energizer® and other manufacturers are announcing their product changeover dates. Energizer, for example, will no longer ship anything to U.S. customers except their "ZeroMercury" products as of June 1st. According to Terry Wiederholt, Staff Quality Assurance Engineer at Energizer, the company has been transitioning away from mercury-added production for many years. He notes that in 1989, Energizer was the first in the industry to offer 0% mercury in alkaline batteries. They followed up with 0% mercury hearing aid batteries in 1991, added the multi-drain batteries to their portfolio in 2005, and began offering ZeroMercury button-cell batteries in 2008.

When asked why button-cell batteries were the last to be transitioned by the industry, Weiderholt explained it was the small size that presented the difficulty. Button-cell batteries are extremely susceptible to even slight impurities. Overall, mercury helped solve many manufacturing problems. The issues the industry needed to address when removing mercury from the manufacturing process included:

- Susceptibility to slight impurities
- Potential of reduced shelf life
- Potential for lower conductivity
- Unpredictable gassing
- Higher cost for alternative materials

Weiderholt stated that Energizer looked very closely at their processes and materials in order to eliminate potential contaminants during manufacturing. They also developed a proprietary plating process to prevent gassing. Additionally, this helped maintain the conductivity and shelf life battery users have come to expect.

Chris Campbell, Energizer's Brand Manager for Specialty Power Products, pointed out that Energizer has nearly 60% market share in retail watch/electronic batteries. This made it vital for the company to develop a 0% mercury product consistent with the quality of products Energizer has always provided. He added that Energizer believes their new batteries will, in fact, deliver the product quality which the industry expects. That's why they can offer the same guarantees on the new ZeroMercury lines as they did on prior products.

Campbell also pointed out that Energizer is very protective of their brand image and quality reputation, and they will continue to improve and even reinvent the ZeroMercury line of products, as with all the products they manufacture. Many of the ZeroMercury products will be produced at the Energizer plant here in the U.S., which is located in Bennington, Vermont.

Other manufacturers are now following suit. We will keep you informed of any new 0% mercury button-cell battery products or market changes in future articles of *Horological Times.* ♦

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As a proven category leader, ***Energizer*** **continues to add energy and excitement** with new innovations geared toward a brighter tomorrow

- **strong brand** that resonates with consumers
- **complete portfolio** of products to drive retailer margin

In 2011, *Energizer* is transitioning all of its watch electronic batteries to ZEROMERCURY®

TM

energizer.com

now that's positivenergy™

Energizer® MAX® Zero Mercury claim: Commercially available since 1991.
Energizer® *Ultimate Lithium* 8x claim: vs. *Energizer*® MAX®. Results vary by camera.

"Here's a New Code, and You Don't Need a Secret Decoder Ring!"

BY TOM PACK

Scan this QR code for a message.

All of us have seen UPC bar codes in various formats. They've come on just about every product we've purchased over the past few decades. Everything, from soup to lumber to watches, has a UPC bar code on it. The purpose of that code is to provide a connection between a physical item, such as a can of soup, and a computer database that stores all of the information the vendor has produced or acquired about that physical item. When you go through the checkout of your store, you either scan the UPC code yourself or the cashier scans it for you. The end result is that the store's database now knows:

- A can of soup was sold, and in fact, it was a can of Campbell's® Tomato Soup.
- It was sold at a particular price, which is then displayed on the cashier's screen and will eventually end up on your receipt.
- The can of soup was sold at a particular date and time, and was purchased with whatever other items you selected.
- The store now has one less can of Campbell's Tomato Soup to sell.
- Numerous other pieces of information that the store will use internally to help maximize their sales and, hopefully, their profits and to promote other items to you through loyalty programs, like store cards.

What Is It?

A new type of computer-readable code called a QR (Quick Response) code was developed in Japan in the mid-1990s. It was created for internal tracking of automobile components, but it is now used for much, much more than that. Usage of this code quickly caught on in Asia, while usage in Europe and North America has been slower but is steadily increasing. Within the past year, you may have noticed these codes in print media or, possibly, on outdoor structures. You are seeing more and more QR codes in these locations due to increased growth in the sale of smartphones and other mobile computing devices. One of the standard applications, or apps, on these phones is a bar code reader. Users can take their smartphone to a store, scan the UPC of a product, and use the internet and their phone to do instant price comparisons, get product reviews and get other information about a product.

Marketers have realized that QR codes can also be read by smartphones, so they have started adding these codes to their ads in order to make the connection between the ad and their website. This connection is exactly like the situation where you bought the can of soup. You have a physical item, such as a can of soup or a magazine ad, which has a unique code, like the UPC on the soup or the QR code in the advertisement. This code is then scanned by a computer through the cashier or your smartphone. The computer then pulls the information from a database and takes you to the correct information, such as an item price, information about a specific product, an e-mail address or a website. It saves the user from typing in a website address or e-mail address. It provides a very quick, accurate and reliable way of making sure the consumer has the correct information, and it also gives the publisher of the QR code the ability to track usage of a particular code to gauge the effectiveness of an ad.

Will AWCI Use QR Codes?

AWCI has decided that QR codes are a great way to provide more information to all of our members. QR codes will provide a way to make the connection between our printed medium, *Horological Times*, and our website (www.awci.com). We will begin using QR codes within notices in the *HT* that describe education programs, products and services, certification schedules and information, and other pertinent information that can be found on our website. We will also be using these codes as a supplement to printed materials we have on hand at trade shows and other venues. Many of the people who attend these events have smartphones. It will be a quick, convenient and easy way for them to retain information about AWCI, so they can contact us with any additional questions or investigate our offerings.

If you have a smartphone, make sure that it has a bar code reader app installed.

Many smartphones already have these installed. For those of you who don't have this app on your smartphone, there are numerous sources where you can download this app, often times at no charge to you.

Why Should I Use a QR Code?

If you have any product or store information you want customers to take with them when they leave your store, consider producing a QR code for the information. Your customers who own smartphones will be able to quickly, easily and accurately gain access, and they can refer to it at their convenience. This also saves you from having to print up flyers, brochures or other materials which take up space in your store and could eventually become obsolete. Creating a QR code is relatively quick, isn't hard to do, and can be done for free. Numerous resources are available on the internet to assist you in learning more about QR codes, how they can benefit you and how you can create your own codes. We believe these codes are an efficient and cost-effective means of communicating detailed information to you, and we also think you can put them to use in your business to help your customers and your bottom line. ♦

Need to Create a QR Code? Try:

Online QR Code Generator
http://zxing.appspot.com/generator/

Common QR Code Reader Apps for Your Smartphone:

QR Code Reader and Scanner for iPhone
http://itunes.apple.com/us/app/qr-code-reader-and-scanner/id388175979?mt=8

Google Goggles for iPhone and Android
http://www.google.com/mobile/goggles/#text

MobileTag QR Barcode Scanner for Android
https://market.android.com/details?id=com.mtag.mobiletag&feature=search_result

QR Droid for Android
https://market.android.com/details?id=la.droid.qr&feature=search_result

How a Father and Son Team Build on a 50-Year Business

BY AMY DUNN

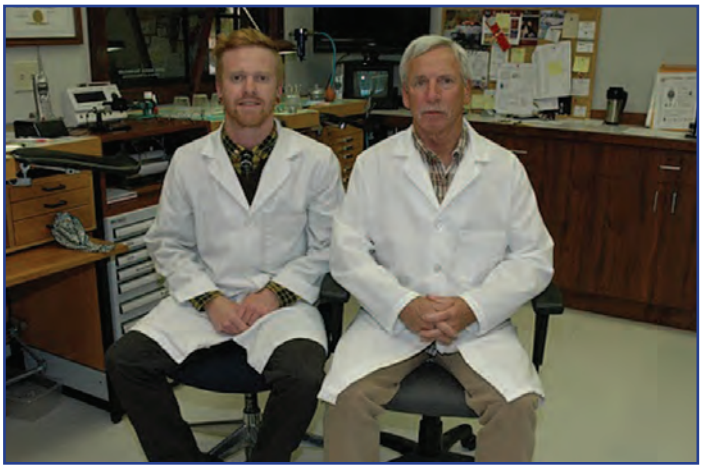


Figure 1: Hayes Jewelers father and son team (left: Cody Hayes, right: Kelly Hayes).

Hayes Jewelers: Growing a Family and a Business in Mission Viejo, California

Kelly Hayes, owner of Hayes Jewelers, likes to talk about how his father started their family business. In the early 1950s, Grover Hayes was working as a watchmaker in a department store. One day, he'd finally had enough of cranky customers and the department store grind. He gathered his family and all the resources he could muster and moved to Laguna Beach, California. A determined individualist, Grover bought both his new business and new home in one day.

Figure 2: Hayes Jewelers, 1978. Left to right: Michael, Grover, Harriet and Kelly Hayes.

Hayes Jewelers was very much a family business from that first day in business in 1962. Grover and Harriet worked and managed the shop together while Kelly and his brother, Michael, literally grew up with the watch and jewelry repair business. Once Kelly graduated from high school, his father asked what direction he wanted to take with his life. Like most high school graduates, Kelly had no idea, but when his father suggested watchmaking, he agreed to try it.

At Gem City College, he found he instantly liked watchmaking and flew through the program in a little over a year. Joining Hayes Jewelers in 1976, he worked side by side with his father. He became an even better watchmaker, and his father pressed him to become a Master Watchmaker, which he did through the original AWI program in 1977.

In 1974, the company became an Official Rolex Jeweler (OJR) which gave the business another boost. Grover and Kelly often attended Rolex training at the New York and Lititz schools. In fact, they were the first father and son to become certified Rolex watchmakers together.

When Grover and Harriet retired in 1986, the two brothers purchased the business. They continued to build their business, especially the Rolex sales and service portion. Kelly's older brother, Michael, eventually wanted to back off from the business to spend more time with his grandchildren. In 2004, they sold their Rolex franchise and moved inland to Mission Viejo where they started anew. Their goal was to simplify the business by only performing wholesale watch repair for Rolex jewelers. However, they had built such a reputation over the years that past retail customers sought them out. It seemed people would gladly drive the extra distance to obtain quality service for their watches.

Educating the Next Generation

When Kelly's son, Cody, was close to his high school graduation, Kelly asked him the same question his father had asked of him: "What do you want to do after you graduate?" Cody answered, "I don't know," the same as Kelly had a generation earlier. But at the suggestion of watchmaking school, he became excited. Kelly realized that things had changed since he had been in school, and he wasn't sure what institution Cody should attend. They consulted Rolex who recommended a WOSTEP program at the time, and after careful consideration, they picked North Seattle Community College. The family believes Cody received a great education there with the help of two exceptional educators, Eric Gresseth and Elaine Rolf.

How a Father and Son Team Build on a 50-Year Business

BY AMY DUNN

While Cody was in school the business became affiliated with AWCI. When the CW21 certifications emerged, they realized how important certification would be for their business. Once again, father and son attended school together—Cody received his CW21 while Kelly gained his CMW21 certification. Today, 50 years after Hayes Jewelers first opened its doors, Cody is the third-generation of Hayes watchmakers.

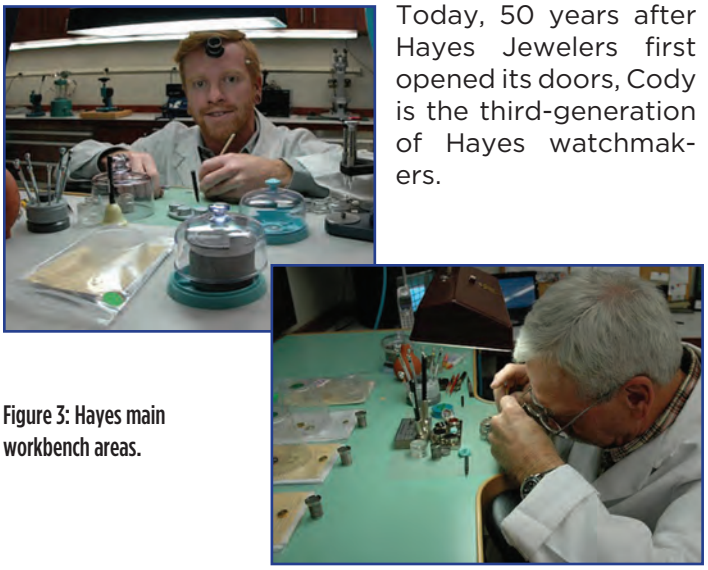


Figure 3: Hayes main workbench areas.

Evolving Into 21st Century Workshop

Hayes Jewelers now has a healthy retail watch and jewelry customer base. The company also performs service work for three Official Rolex Jewelers around the country. They service approximately 500 Rolex watches a year, which represents 95% of their business. Hayes is also the only outside service department for the high-end Oakley line of watches. Because Cody trained on Omega watches while in school, they also accept Omega repairs. Michael still handles jewelry repair and refinishing services on Rolexes, while Kelly's wife, Carrie, manages customer service and administrative functions.

Recently, Hayes Jewelers remodeled their shop. Over their 50 years in business, Hayes believes they have learned some important lessons in the art of watchmaking. They've learned you collect a lot of "things" over the years, from good customer relationships to a lot of clutter. According to Hayes, the relationships you want to keep—the clutter, you don't. During the remodel, they made sure every part, tool, watch and operational area had a specific place within their shop for proper workflow. Kelly notes that Rolex was very helpful in the process, providing both floor plans and advice.

"Our shop is designed so I can open a sliding glass window between the bench area and the in-take counter. I can easily show the customer the problem with their watch and talk with them about a diagnosis without leaving my bench." He says customers are always interested to see the work area, and they also notice the cleanliness. This, he believes, tells customers that their valuable timepiece will be well cared for while it's in their shop.

Figure 4: Glass window opens between in-take counter and bench area for customer interaction.

Work Flow in the Shop

The Hayes workbenches are divided by a Lista parts cabinet designed to accept Rolex parts containers. All parts have a labeled tab for easy identification. The outside of the cabinet holds basic information on the contents of each drawer labeled with a P-Touch hand-held labeling machine. "For example," Hayes points out, "Drawer 1 is labeled 'Tubes and Crowns'

Figure 5: Workbenches divided by Lista parts cabinets to keep frequently-used materials within reach.

How a Father and Son Team Build on a 50-Year Business

BY AMY DUNN

Figure 6: Parts labeled for easy identification and redordering.


Figure 7: Well-lit workspace for larger tools and equipment.

and inside the tray columns have tabs clearly labeled with part numbers."

This helps make it quick to locate parts and to see when it's time to reorder. The parts reorder sheet is kept directly above on a shelf. "When we discover a part is needed," Kelly explained, "It's simple to jot it down without having to move anywhere."

Stainless steel drawers are incorporated into the cabinets directly behind them. These hold most of their larger tools and equipment. This area offers a nice worktop, is well lit, and is where the presses, openers and water-testing equipment are kept. With this workspace area directly behind them, each watchmaker can move freely without disturbing the other. Reference manuals are neatly organized and stored behind cabinet doors in a well-lit work area. Polishing systems are located in a separate room off the main work area.

Building Business through AWCI and Online Marketing

Being an AWCI member, Hayes participates in the www.awci.com Online Referral Directory. They've had numerous leads from the service over the years. Another internet resource they've recently discovered is Web Reach through Yellow Book search engine marketing. Although similar to Google Adwords, they believe it's better because it helps your website appear at the top of the page on the top three search engines: Google, Bing and Yahoo! They also like the fact that there was a flash presentation produced as part of the pay-per-click package they bought to target prospects within a twenty-mile radius around their location.

How does it work? When a local customer clicks on their online ad, they reach a conversion page. The conversion page contains company information, the flash presentation and an interactive map that clearly shows their location, which is sometimes hard to find at the back of a local business park. They're also using the flash presentation on their website at www.hayesjewelers.net. Hayes invites readers to go online and check out these sites.

Figure 8: Hayes obtains business leads through online marketing.

Goals for the Future

This father and son team at Hayes Jewelers believes in the importance of maintaining the education, certification, proper organization and good business practices they have developed over the years. They work to perfect every process in their business, from

How a Father and Son Team Build on a 50-Year Business

intake to customer delivery, and they look to incorporate new technologies to position their company for the future. Kelly and Cody Hayes are also proud to be a certified Rolex service shop.

Figure 9: In-take procedure.

Their ultimate goal, however, is true customer satisfaction, both for their wholesale business clientele and their retail customers. They hope they will continue to grow by breathing new mechanical life and cosmetic beauty into each watch they repair. ♦

Hayes outlines a nine-step process for in-take and completion:

1) Log in of arriving watches by serial number, model number and value. Jobs are tracked in and out, whether hand-delivered or shipped.

2) Watches placed in 5" x 8" plastic envelope. Placed into "incoming box" inside a safe for estimating.

3) Watch estimated using customized QuickBooks invoice. Red sticker placed on outside of plastic bag to avoid confusion. Invoice/estimate includes "proceed" check box and "cancel" check box at bottom of page.

4) Estimates faxed to jewelers are then placed in estimate box awaiting approval.

5) Once approved, green sticker placed on bag. Proceeds to "ready to be worked on" box.

6) Watch is broken down separating movement from case and band which are placed into another plastic envelope with jeweler name, customer name and job number. Work is then placed into "refinish box." Movement goes into plastic divider tray in original job envelope and is sent to assigned watchmaker.

7) Once the movement and refinish are completed, these are placed into "ready to be assembled box."

8) When refinish and movement overhaul are complete, they are assembled, timed-out and water-tested. Once all final tests are complete, watch is placed in "call-out box."

9) From "call-out box," customers are contacted and job is placed in "finished box."

BY JACK KURDZIONAK, CW21

A Personal Remembrance

A few days ago we received word of the passing of Klaus Lehmann. Klaus was well known to many of our members as an executive with Swatch Group's after-sales service here in the U.S. Additionally, Klaus's involvement with watchmaking went far beyond his corporate activities. He was a well-known advocate for several American schools of watchmaking. Many members knew him personally from his regular attendance at AWCI's semi-annual meetings. For many years, Klaus was a welcome, regular visitor to our shop as part of his duties with Swatch Group. The purpose of these visits was to ensure that our shop, and the others he also visited around the country, met Swatch Group's standards for belonging to the Swatch "After-Sales Service" team. Always the professional, Klaus was also personable and conversational as we shared a pot of coffee during his stops.

After his first visit, he politely stated that our shop had promise, but it did need some low-cost modifications. Mainly, we had to clean up our shop. He did not provide any details, but we realized what needed to be done. We had been in business for many years, and, like many watchmakers, we saved everything and anything. Over the years, we had literally filled the 600-square foot work area until there was almost no empty space. The walls needed some bright paint. The old dust-collecting shelves had to go, and any needed equipment (formerly stored on those shelves) was placed in neat cabinets. The ten-plus antique GS crystal cabinets went to the cellar. Since we only accessed them about ten times a year, it was not too much of a hardship to walk down a flight of stairs to look for an antique crystal. The eight staking tools were reduced to one, with some of the remaining seven sold, and the others were saved in the cellar. The same went for the duplicate lathes and other seldom-used tools. At the same time, the electrical utility was offering to install energy-efficient lighting in all the commercial buildings in our town at almost no charge. This was a no-brainer. The bill to upgrade the lighting was about $2000, and we paid $400. It upgraded the shop lighting for color and brilliance, while cutting the power bill by one-third.

Klaus Lehmann

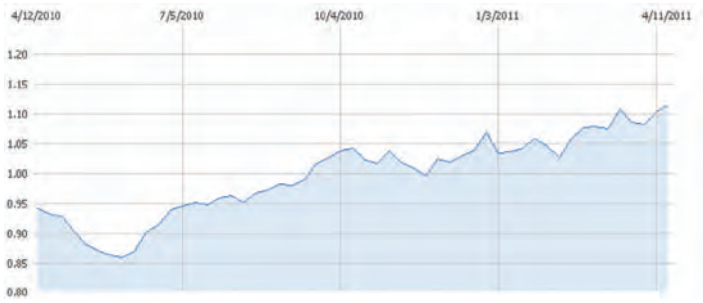
On his second visit, Klaus noted the progress we had made and invited us to Swatch headquarters, then in Lancaster, Pennsylvania, for additional training. As the years went by, Klaus made various suggestions on how to improve the shop, from ways to help its physical appearance to the proper equipment to service modern Swiss watches. In fact, subsequent visits by representatives from other companies have validated his suggestions. About five years ago, he suggested it was time to purchase a Natator 125 machine to confirm the water resistance of professional divers' watches. A few years later a visitor from another company stopped in while the Natator was being used to test an Omega Seamaster watch. The visitor was surprised we already had the machine that his company was going to require within a year.

We, and I am certain I can speak on behalf of many AWCI members, owe a debt of gratitude to Klaus for his support, encouragement and his friendship for many years. Goodbye Klaus. ♦

Jack Kurdzionak

BY JACK KURDZIONAK, CW21

Beyond Our Control: The Rising Cost of Imported Goods



The above graph displays a serious problem for watchmakers. It is a one-year chart of the Swiss franc's value vs. the U.S. dollar. A glance at the chart shows that in May 2010, a Swiss franc cost $.86. By April 1, 2011, the same Swiss franc cost $1.11, which is a 29% increase in the cost of anything we purchase originating from Switzerland. Regardless of whether we are buying Swiss watch movements, Swiss watchmaker's tools, or Swiss chocolate, they all cost at least 29% more than they did last year. For whatever reason or reasons, the U.S. dollar has significantly weakened against almost every foreign currency in the past year. Thus, whatever we buy that originates outside of the U.S. is costing more than it ever has in the past. For Americans involved in export industries, the weak dollar is a good thing. It makes our exports more inexpensive for other countries to buy, so our exports will grow. Unfortunately, we watchmakers are involved with imported goods, and the cost of those imports is way above what it was in the recent past.

As individuals, we are powerless to control the value of the dollar. We have to leave that to the governments of the various countries. While we can hope for a recovery of the dollar's value, we do need to adapt, and adapt quickly, to its current low value. There is no way we, as individuals, can absorb these punishing exchange rates. We need to increase the prices we charge for Swiss parts and do it immediately. The part that cost $10 a year ago will now cost about $13. Our suppliers cannot absorb these increases, nor should we. They need to be passed on to the consumer who is the end-user of the Swiss parts.

No one likes to increase the prices they charge, but if we do not, the only alternative is to take a cut in pay to compensate for the higher cost of Swiss parts. You can be assured that very few watchmakers will volunteer to accept a cut in wages just to keep the retail price of repairs at the same level as it was a year ago. Some customers will complain, but most will understand what is happening to our once "Almighty Dollar." They see it every day at the gas pump, and they accept it as a reality beyond their control. ♦

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Winding Intermediate Wheel Post Repair, Part 1

BY DALE LADUE, CMW21

Advertising frequently depicts fathers and sons looking admiringly at a timepiece. Because watches are passed down through generations, future watchmakers will need to have a practical working knowledge of repair techniques for modern, as well as vintage timepieces. Yet, it never ceases to amaze me how modern timepieces exhibit wear that much older watches do not.

Proper servicing can be taught, and a regularly-serviced timepiece is a joy to clean and oil. However, the owner or next generation owner may not consider servicing at all, or only sporadically. With parts that have become non-existent, either through obsolescence or restrictive policies, practical quality repair techniques will always be necessary.

I have written, and AWCI has published, several articles concerning the repair of dial train intermediate wheel posts. In this particular example, the winding intermediate wheel post is severely worn. The winding train in this timepiece consists of a crown wheel, an intermediate wheel on a post and a spring-loaded pivoted pinion. The small pinion will slip out of mesh with the ratchet wheel as the automatic winding gear train turns the ratchet wheel. When the watch is wound manually, the pressure drives the pinion leaves into the ratchet wheel, thus winding the watch. This arrangement is shown in Figure 1.

Figure 1: The winding gear arrangement was exposed after its cover plate was removed.

There is a small plate that covers this gear arrangement. Except for some tell-tale metal dust, a post worn to this degree would not be seen. As shown from two perspectives, drastic wear is visible on the post after removing the plate. Figure 2 depicts the feathered edge of the groove worn in the post, and

Figure 2: A view showing the extent of the wear on the post.

Figure 3 shows the depth of the groove. This particular repair demonstrates a procedure that will return the post to its original dimension. The different options for the post restoration are to: (1) replace the complete bridge, if obtainable, (2) make a complete threaded post that would be riveted in place, or (3) fill the wear groove.

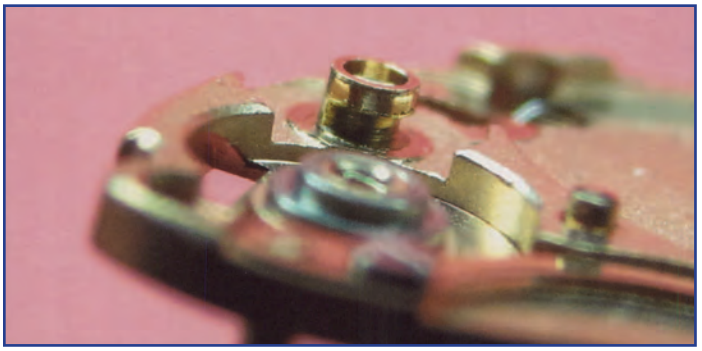


Figure 3: The depth of the wear nearly reached the internal threads.

Figure 4: A bronze clock bushing was used.

In order to preserve the thread and all of the other dimensions, I decided to fill the groove. Figure 4 shows a bronze clock bushing next to the bridge. The bushing was mounted in the lathe and turned down to slightly larger than the intermediate wheel hole (Figures 5 and 6). Holding the wheel up to the

Winding Intermediate Wheel Post Repair, Part 1

BY DALE LADUE, CMW21

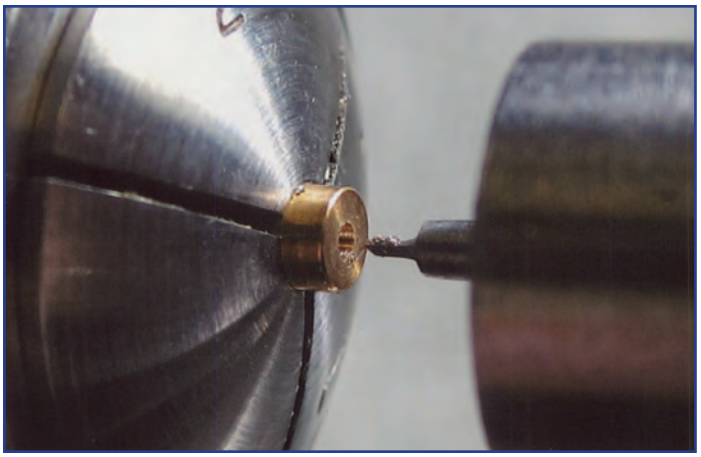


Figure 5: The bushing diameter was turned down to the inside diameter of the intermediate wheel.

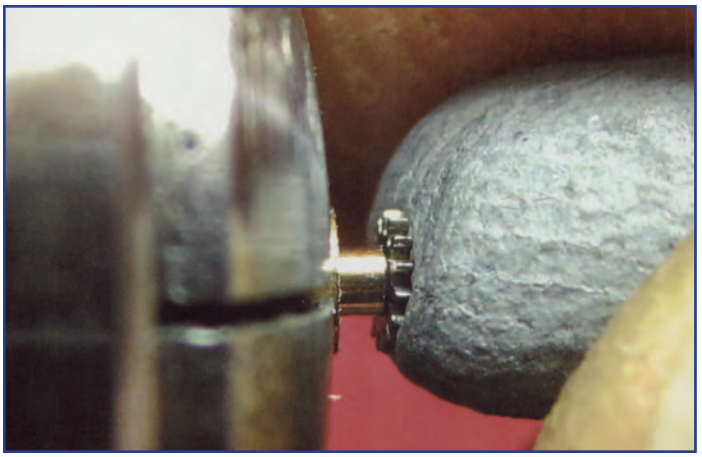


Figure 6: The wheel was tested for fit.

Figure 7: The wheel was used to gage the thickness of the repair piece.

Figure 8: The piece was parted and captured by a pointed peg wood stick.

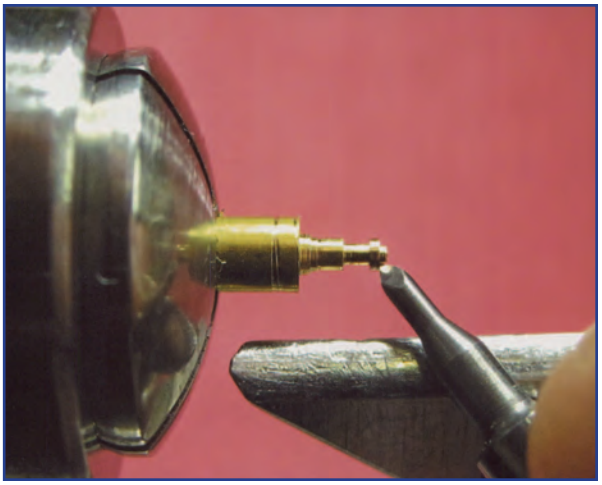


Figure 9: A mandrel was made to a tight fit inside the bushing.

turned bushing determined the thickness of the repair piece (Figure 7). The tiny piece was parted, as shown in Figure 8.

A mandrel was turned out of brass onto which the tiny bushing was friction fit (Figure 9). The rough parted end was turned smooth as the height was adjusted to fit snugly into the wear groove, as shown in Figure 10. The bushing was sawed in half by a razor blade, providing two pieces. One of the halves was inserted in the groove, as shown in Figure 11.

It became obvious that the wear created a greater diameter than the inside diameter of the repair piece. Consequently, I had to file the inside diameter to match the wear diameter. Figure 12 shows the repair piece held in a pin vise as it was carefully filed.

The finished repair piece was checked against the wear contour until it matched as close as possible. Looking closely at Figure 13, you can see that the contour of the inner diameter conforms to the milled diameter line that surrounds the post. ♦

Check out the June issue of Horological Times for part 2.

Dale LaDue is a second generation watchmaker-clockmaker who has been a contributing author to *HT* for many years. A graduate of the Gem City School of Horology, he has been in business in the Rochester, NY area for nearly 30 years. Dale's work covers the gamut of "challenging situations," which are often the topics of his articles. Dale is also the current president of the New York State Watchmakers Association.

Winding Intermediate Wheel Post Repair, Part 1

BY DALE LADUE, CMW21

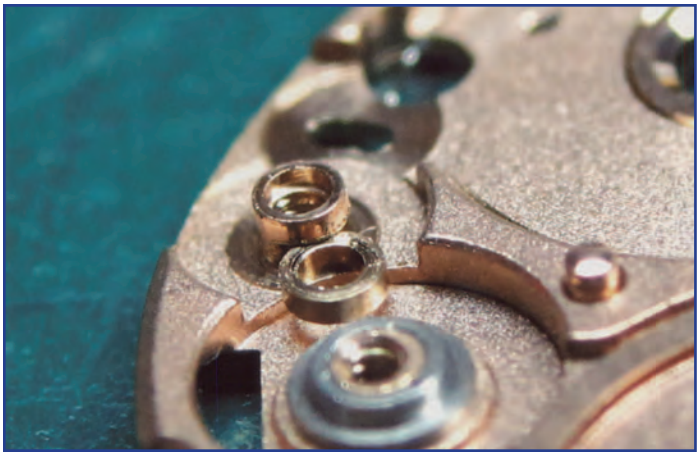


Figure 10: The height was turned down to fit snugly into the wear groove.

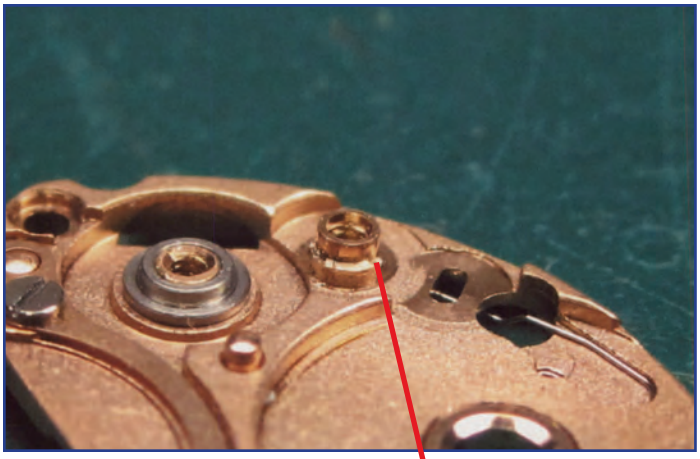


Figure 11: One half of the bushing was tested for fit.

Figure 12: The inside contour was filed to conform to the groove.

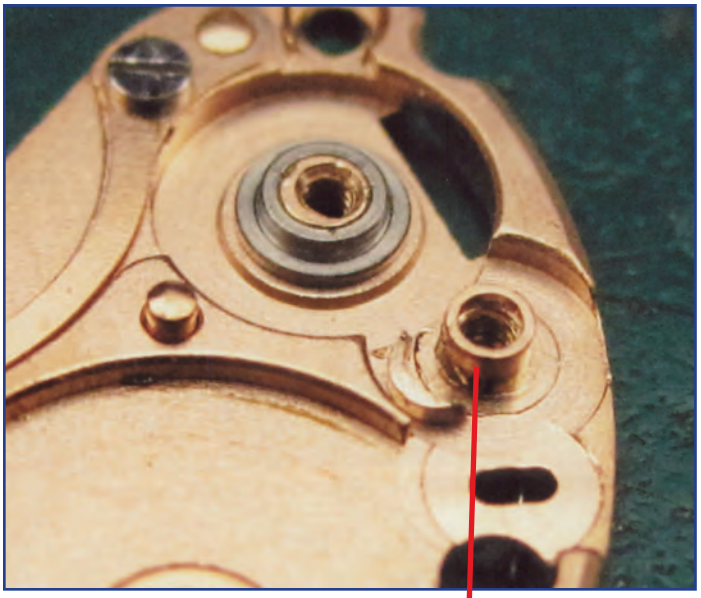


Figure 13: The repair piece resting next to the worn post.

The Quartz Watch With A Mechanical Tick

BY DEAN ALAN POWELL

This article details the operating principles of the Rolex caliber 5035/55 with a focus on the Rolex stepper motor

Preface

Not all watches are created equal. This is a generally accepted statement when referring to mechanical timepieces. Regarding quartz watches, often no technical distinction is made internally between the five-dollar drugstore watch and high-grade Swiss and Japanese offerings. The reasons for this vary. One may be that even the cheapest quartz watch, under normal circumstances, is viewed as more accurate than its mechanical cousin. This statement, of course, elicits a fury of remarks from watchmakers and connoisseurs. This is because there are so many qualifying factors that go into making a quality watch, be it electronic or mechanical. In the following text, I will be touching on some of the finer points of a quartz watch movement that differs from most or all of the quartz movements that have been produced. Since the fevered beginnings of this particular facet of the complex structure that is horology, the Rolex 5035/55 stands alone. I will cover general historical and technical data relevant to the understanding of the subject for the reader who may not be a watchmaker. This work is not meant to serve as a technical guide because that already exists. It is meant to educate those who may not already know that not all quartz watches are created equal.

Seiko Astron 35SQ. Photo courtesy of the Smithsonian Institute and the Seiko Corp.

When Did Watches Get So Quiet? A Brief History of the Quartz Watch

In the 1960s the push for a new timekeeping standard was a global affair. The Japanese had been at work since 1958 with the sole intention of produc-

The Quartz Watch With A Mechanical Tick

BY DEAN ALAN POWELL

The CEH occupied a portion of this building at Neuchatel when it was set up in 1962. Photo courtesy of the Smithsonian Institute.

ing a wrist-sized timekeeper that made use of the quartz crystal as an oscillator. Their efforts paid off 10 years later with the introduction of the 35SQ Astron by Seiko in 1969.

At the CEH (Centre Electronique Horloger), a Swiss laboratory set up in 1962 for the purpose of exploring new technologies in the field of electronic timekeeping, work had yielded the first quartz watch prototypes by 1967 and by 1970. The Beta 21 was introduced to the market under nearly 20 different brand names. This is because the CEH was put together and funded by an industry collective of about 20 different watch brands, including names like Rolex, Omega, IWC, Bulova and Patek Philippe.

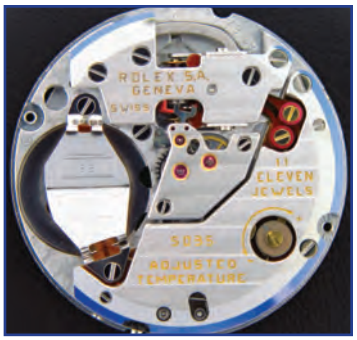
Hamilton released the Pulsar in collaboration with Electro-data. Photo courtesy of Eric Long and the Smithsonian Institute.

In America, the Hamilton Watch Company began work in 1966 and introduced the first digital quartz watch in 1972. The Pulsar made use of LEDs (light emitting diodes) to display the time with digits. The power hungry LEDs enjoyed a relatively short life span and gave way to the far more energy efficient LCD (liquid crystal display), which most people are familiar with today.

The 1960s saw all of these different disciplines brought together for the singular purpose of producing a highly accurate wristwatch: the discovery of the Piezoelectric effect of quartz crystals by Pierre Curie in 1880, the manufacture of the first quartz crystal resonator by Walter Guyton Cady in 1921, and the co-invention of the integrated circuit by Robert Noyce and Jack Kilby simultaneously, while working at different labs, in 1959 – an invention that would aid heavily in the miniaturization of electronic watch components. The quartz watch could be seen as an inevitable conclusion to all the work in various related and unrelated fields that had been done for decades all over the world.

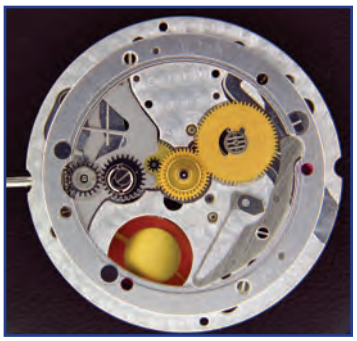
History and Overview of Rolex 5035

In 1972, a mere two years after the launch of the Beta 21, Rolex began development of their own quartz caliber in spite of the fact the Beta 21 had been partially funded by Rolex themselves. Rolex is not usually forthcoming with information about such decisions. Some watchmakers speculate that they did so because the Beta 21 was difficult to service. Also, advancements in the technology were developing so fast that it seemed a natural progression. After five years of research and development, they launched the caliber 5035 (with date) and the 5055 (with day and date) in a watch known as the Oyster Quartz.



Rolex 5035

Aesthetically, the watch was a departure from the look of the classic Rolex with its integrated bracelet and case shape. Production ran from 1977 until around 1999. Only 25,000 pieces were produced during this fairly long run. Some collectors attribute the lack of commercial success of the Oyster Quartz to its unconventional looks, while others have become fanatics. Currently, two fan sites exist devoted solely to this watch. It has a fit and finish that stand out to this day among high-grade quartz watch movements.

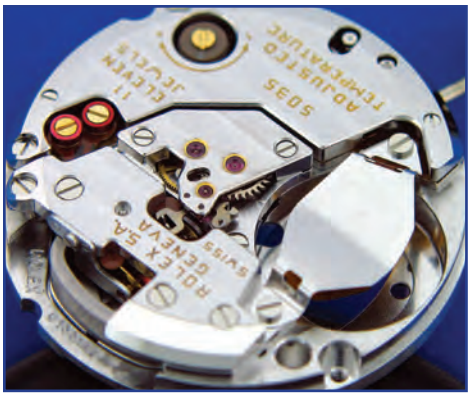


Dial side view without date disk. Note the date jump mechanism, it is identical in principle to that of the Rolex 3035.

Much of the movement is quite similar in look and construction to a mechanical watch. The wheels and pinions are of classic design. The bridges (yes, bridges, not just cover plates) are decorated Geneva Stripes. It has eleven jewels, a stop seconds mechanism and an instantaneous date jump system that is identical to that of the principle mechanical Rolex caliber of the time, the 3035. The movement is equipped with a trimmer that allows adjustments of up to 2 seconds per day +/-. A trim-

The Quartz Watch With A Mechanical Tick

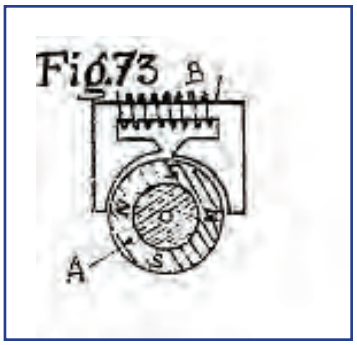
BY DEAN ALAN POWELL



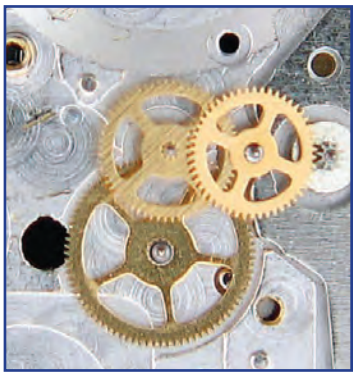
When out of the case the movement definitely has a robust look with an overall diameter of 29.75 mm and a height of 6.35 mm (7.11 mm for the 5055).

mer is a regulation device with a slot so that it may be rotated by a screwdriver. It adjusts the rate by forcing the quartz crystal to vibrate at a desired rate through the regulation of current. It is no longer used because forcing the crystal to vibrate at an unnatural frequency consumes more energy resulting in shorter cell life. Modern quartz watches use a more efficient method that allows the crystal to vibrate at its natural frequency. Timing errors are corrected with the Integrated Circuit (IC). The IC is a CMOS (Complementary metal–oxide–semiconductor) type which is a step up from the ICs used for the Beta 21, in that they consume less energy to operate. This is a good thing because with an average consumption of approximately 5-6 micro-amps the 5035 is not the horological equivalent of a hybrid automobile. The watch is designed to run its best at a temperature of 28º Celsius (82.4º Fahrenheit). This has been determined to be the approximate temperature of a watch when worn on the wrist.

fortunately, many books on the subject make no distinction between the types of Lavet motor used. This is important because, as stated above, he had over 70 variations many with distinct differences in how they operate. To fully understand the Lavet motor and the Rolex approach, a quick lesson on the operating principles of the quartz watch is necessary.



Above: Excerpt from Marius Lavet's original patent application. This is the most common type of Lavet motor in use today. Below: View of a rotor within a stator and the gear train of a common quartz watch.



The principle components in a quartz watch are the power source or the cell, the quartz crystal resonator, the IC (integrated circuit), the stepping motor, the gear train, and ultimately, the hands and display. Please consult Figure 1. Energy passes from the cell to the IC chip, which powers the quartz crystal. The quartz crystal then cleans up the dirty signal and transmits back to the IC, a signal that is resonating at a frequency of 32,768 Hz. Within the IC, a divider circuit

Which Lavet Motor?

Marius Lavet was born in 1894 in Clermont-Ferrand, France. He was a French engineer and did extensive work in the field of horology. He is generally considered to be the inventor of the micro-stepping motor known as the Lavet Motor. At the time he submitted his request for a patent, on September 28, 1936, he had over 70 variations of his invention. His patent was granted in 1937.

The most common variation can be seen in almost every quartz watch on the market today. Un-

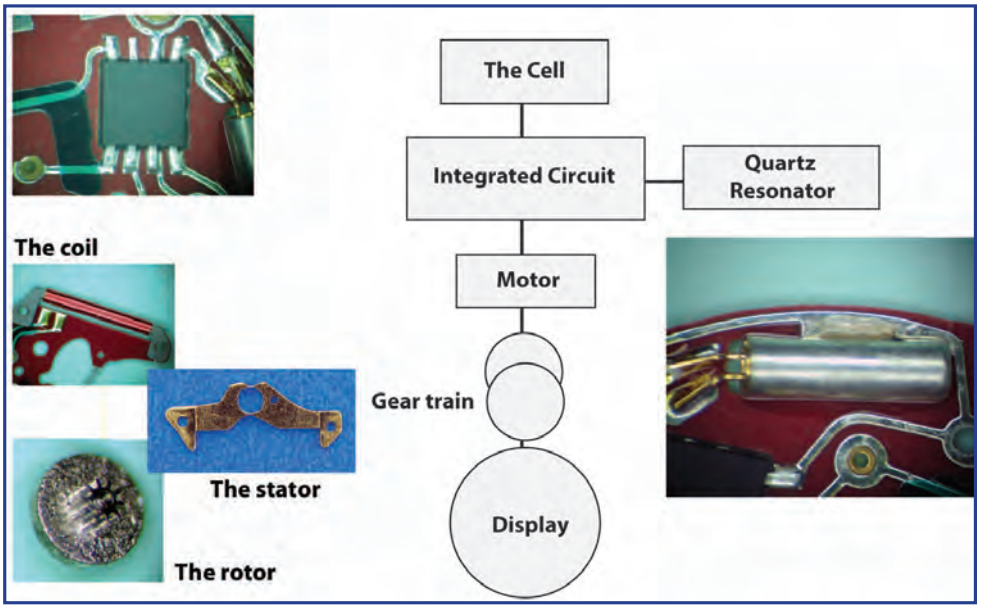


Figure 1

The Quartz Watch With A Mechanical Tick

BY DEAN ALAN POWELL

steps down the signal fifteen times until it reaches a very steady one impulse per second. This current is then fed to the motor. The motor is comprised of three components: the coil, the stator, and the rotor. The coil receives the current from the IC. As the current passes through the coil it creates a magnetic field that is transmitted to the stator. The stator and the coil usually share a mechanical connection; however, power is never transmitted through the stator. It merely acts as an electro-magnet with the polarity traveling in one direction. The rotor is a permanent magnet with hemispheres of opposing polarity. It has pivots, so that it may rotate, and a pinion, so that when it rotates, it will in turn rotate the intermediate wheel of the gear train. When the magnetic field passes through the stator, it reacts with the polarity of the rotor, and as everyone knows when you try to force two magnets together of the same polarity, they repel one another. Opposite polarities attract. The rotor rotates 180º until it is attracted by the opposite polarity and it stops. The current then runs through the coil in the opposite direction forcing the same action, only changing the direction of polarity in the stator and causing the rotor to once again rotate 180º. This happens once every second in most quartz watches. Again, to recap, the magnetic field from the stator acts upon the rotor causing it to rotate, which rotates the gear train. This creates the motion of the hands and tells us the time.

View of stator, rotor, and gear train with bridge installed.

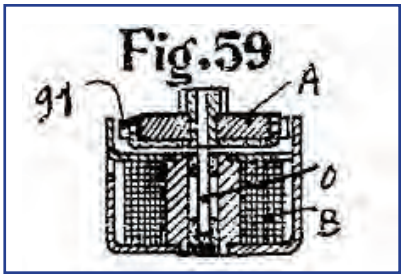
The power to move the hands practically appears out of thin air. If this engineering feat had been produced in 11th century Europe, it would likely be considered witchcraft. The benefit is that this configuration is very cheap to produce. The down side to this type of Lavet motor is that it produces a very small amount of torque. It doesn't take much to stop most quartz watches. In extremely cheap models, the hands can give away poorly manufactured components, loose tolerances, and cheap materials in the form of slightly erratic hand movement, particularly in vertical positions. Most people don't notice this, but once you do, it is virtually impossible to ignore.

"By 1990, watchmakers predict, 90 percent will not tick. With or without hands, watches these days are more likely to beep, chime, buzz or blink."

James P. Sterba
The New York Times, February 9th, 1982

Operating Principles of the Rolex Stepper Motor

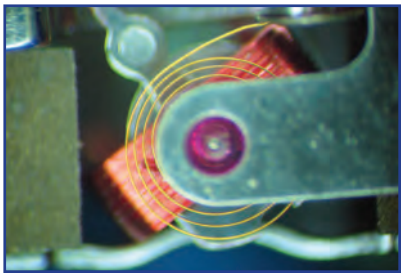
The 5035 makes use of a completely different type of Lavet motor and Rolex made it their own. In any type of stepping motor, something has to move. In the example given previously, the rotor or permanent magnet rotates. In the Rolex stepper motor, the magnets are fixed and the coil moves instead.



Excerpt from Marius Lavet's original patent application showing one the variations that may have provided the inspiration for the Rolex stepper motor.

Above: View of the mobile frame wrapped in wire to form the coil with pivots at either end, which rotate within jeweled bearings.

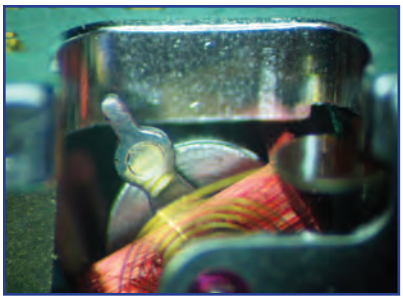
Below: View of the spiraled wires that transmit current from the printed circuit to the coil.



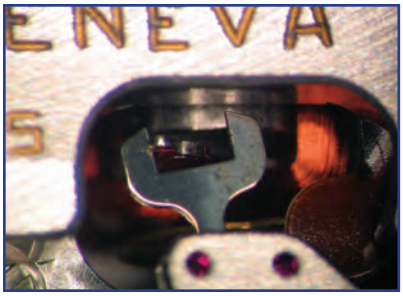
The current is passed through spiraled wires to a mobile frame that is wrapped with insulated wire to form a coil. This frame has pivots at either end, giving it an axis of rotation. The spiral wires that resemble the hairspring in a classic mechanical movement have a dual purpose. They transfer power to the coil and also serve as springs to give the frame a horizontal resting position, which assists in the pivoting action. The frame rotates around a core that is attached to an assembly known as the carcass. Located on either side of the core are relatively large, permanent fixed magnets, which are also attached to the carcass. Just as the other type of Lavet motor, the current,

The Quartz Watch With A Mechanical Tick

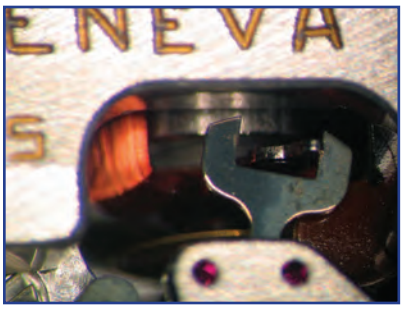
BY DEAN ALAN POWELL



View of the finger attached to the mobile frame. It interacts with the pallet to convert the movement of the mobile frame to the mechanical motion that ultimately drives the hands of the 5035. Note the small circular magnet.



View showing the pallet and finger in one extreme position before impulse.



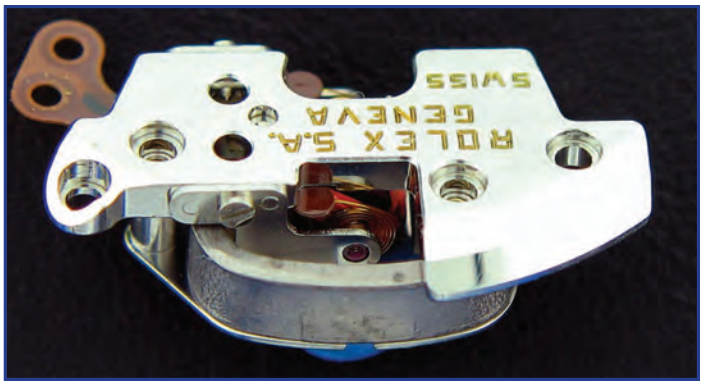
View showing pallet and finger after impulse in the other extreme position.

impulsing once per second, is fed to the mobile coil.

The current passing through it generates a magnetic field that is repelled by the permanent magnets on either side, causing it to rotate. This frame, however, does not rotate 180º. It only pivots 45º from one side to the other. At one end of the pivoting coil is a finger that is in contact with a pallet. The pallet rests against banking pins, which limit its travel and that of the finger and is held in place between impulses by a small magnet in the tip of the finger. This finger wags back and forth once per second moving the pallet, which in turn drives the second wheel. The second wheel resembles the escape wheel of a classic mainspring-driven watch. As the pallet makes contact with the banking pins, it creates a tick much like that of a pallet making contact with the banking pins or walls in a mechanical watch. This makes the Rolex 5035/55 one of the few, if not the only, quartz watch with a mechanical tick. The benefit to this system is that it registers a very crisp, precise motion in the display of the counting seconds. This is due to the fact that the gear train is actually driven by a mechanical action. The down side, of course, is that it is not nearly as cheap to produce as the first example and consumes more energy to operate, but it is nonetheless unique in its design and execution.

Summary

At the time Rolex began development of the 5035, the operating principles of its contemporaries varied greatly. Over the past 30 years most of those designs, including this one, have been eliminated. Nearly all of the quartz watches produced today are identical in the way they operate. This example may not be the most efficient in terms of power consumption, but it is definitely an example of a company putting its best foot forward and producing a movement that at the time was superior and still is in many regards. It is a quartz movement that offers serviceability and longevity. These are not concepts that seem to be at the forefront in much of the development of quartz watches today. ♦



Enlarged view of the motor complete. While the motor can be completely disassembled and serviced, the parts are not available separately. The motor is only available as a complete unit from Rolex.

Note to the watchmaker: It is common for small cracks to appear on the neck of the small protruding portion of the flexible printed circuit leading to the motor. These cracks do not diminish functionality; they are merely cosmetic. The cracks form in the resin because this is the weakest link between two relatively heavy components. As long as the embedded traces are not damaged the watch will perform as designed.

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The Modern Westminster Chime

BY LAURIE PENMAN

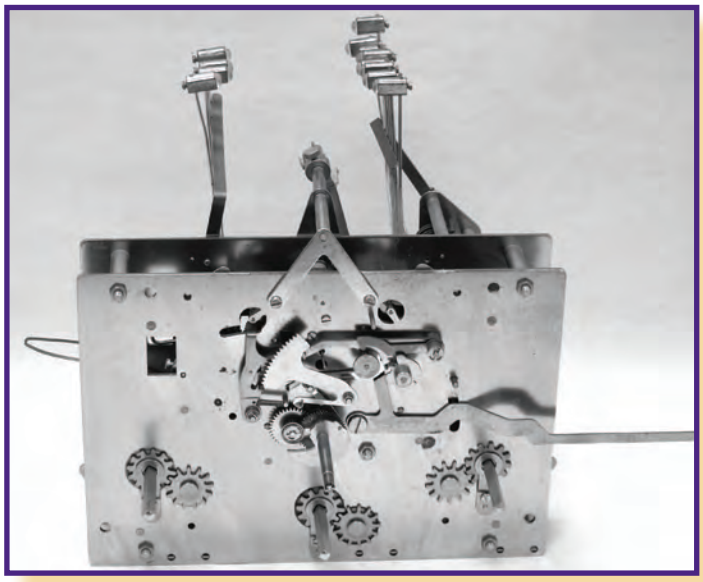

Figure 1

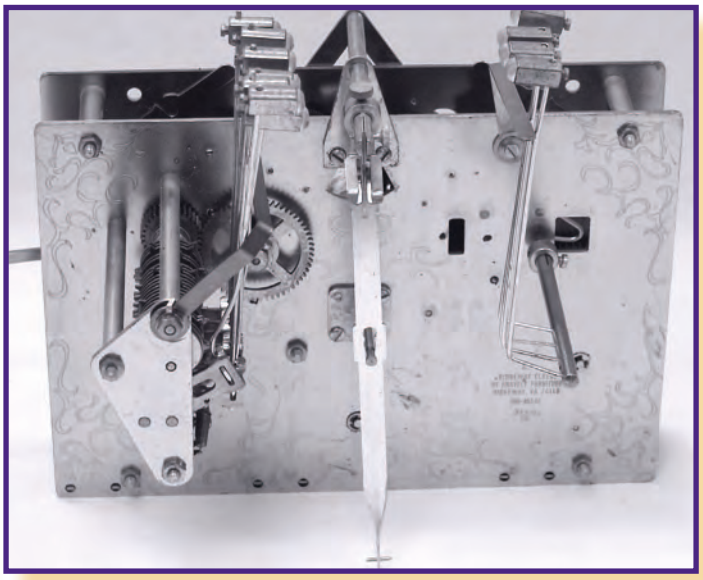

Figure 2

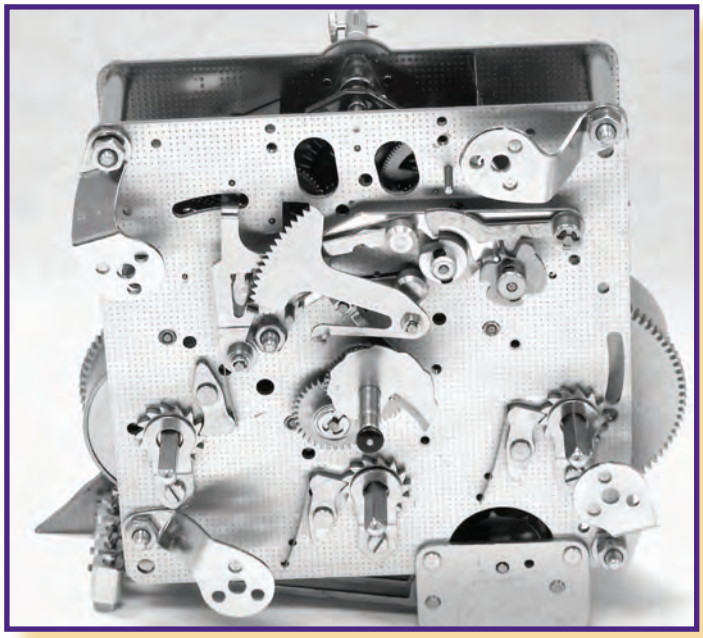

Figure 3

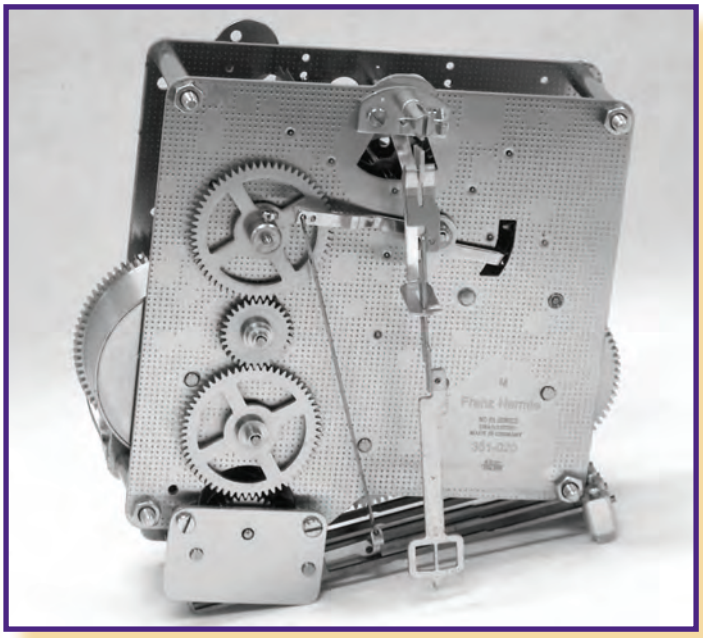

Figure 4

The Movements

Figure 1 and Figure 2 are front and rear views respectively of a weight-driven, three-tune chiming clock. Figure 3 and Figure 4 are front and rear views of a spring-driven movement playing Westminster chimes only. Both are typical of the modern chiming clock movement. Although there are differences between these and other modern clock movements that will come to the work bench, the differences are mainly dimensional and are different means of achieving similar actions.

The correcting devices demonstrate this well. The action requires the chiming train to be held back after chiming the quarter before the hour. It is only released when the hour hand and arbor raise the lifting piece higher than on the other three quarters. This may be accomplished using a pin and a loose hook, slots and a loose hook, and one or two other devices. The effect is the same—the train is held back until there is a higher lift to the lifting piece than at the quarters. This only occurs at the hour, and so the chiming is allowed to work only when the minute

BY LAURIE PENMAN

hand reaches the twelve o'clock position. (Correcting devices will be discussed next.)

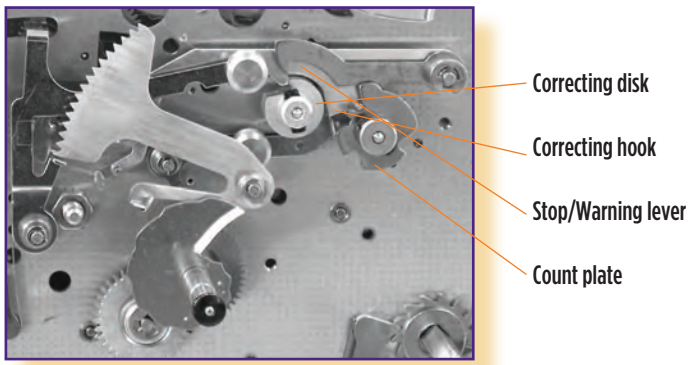

Figure 5

Modern chiming clocks are developments of the German chiming clock of the late 19th century and early 20th century and follow the pattern of chimes first, followed by the strokes of the hour, in the same manner as the British chiming clocks of the period. French clocks that strike or chime the quarters, usually reverse this, striking the hours first and then the quarters.

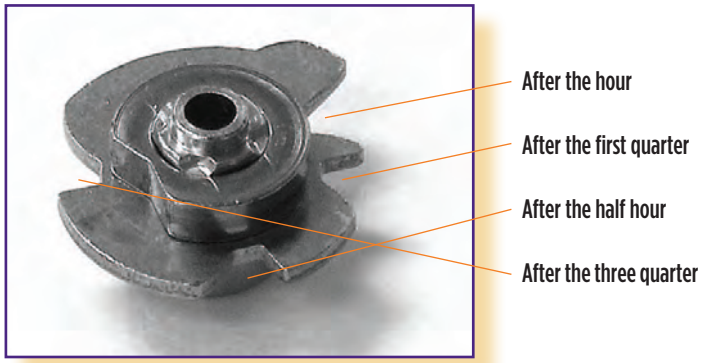

Figure 6

Chiming Train

The modern German chiming train makes use of a count plate to govern the tune. It is simpler to arrange for chime correction with a count plate (that rotates), than it is with a rack, which falls through an arc. Both rack and count plate can be seen in Figure 5, but only the latter has anything to do with chiming. If the count plate is removed (Figure 6) its design can be seen more clearly. I label the spaces where the count hooks drop after each set of chimes. This is a visual aid because the spaces are more obvious than the lobes between them.

Note that the lobe immediately before the 'after the hour' space has a raised portion at the end of its run. This is to raise the warning lever for the strike and position the rack hook so that it drops freely. The count plate in the figure has its back uppermost so that part of the correction device can be seen—this is a notch in a disk. Notice that the notch is almost in line with the space after the three-quarter chime. Figures 5, 7, 8 and 9 show the sequence of events as the various quarters are chimed. In Figure 5, the first quarter is ready to go. The rack is held up by its hook. You'll notice the correcting hook is free of the notch in the correcting disk, and the stop lever is holding the train—it is resting in the notch of the correcting disk. This hook is also the warning lever for the strike. The chime warning is off the small lifting piece, which is obscured in this view, but can be seen in Figure 10.

Figure 7 shows the movement in the process of chiming the first quarter and the chime warning has dropped. The count plate is revolving and is hold-

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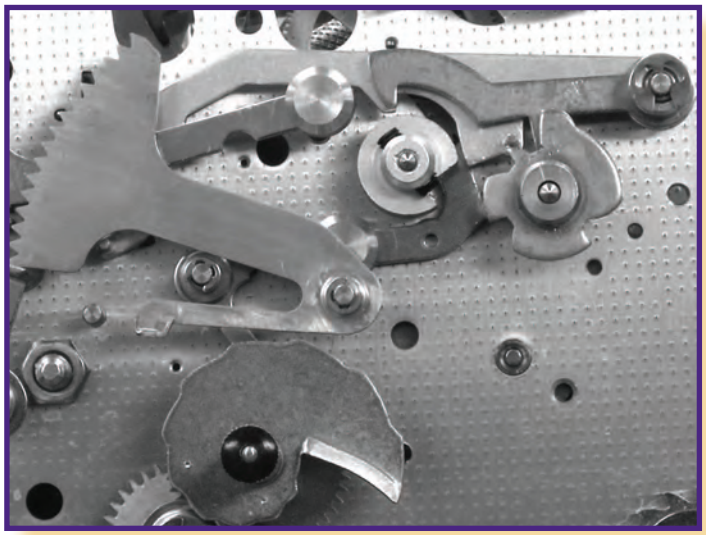

Figure 7

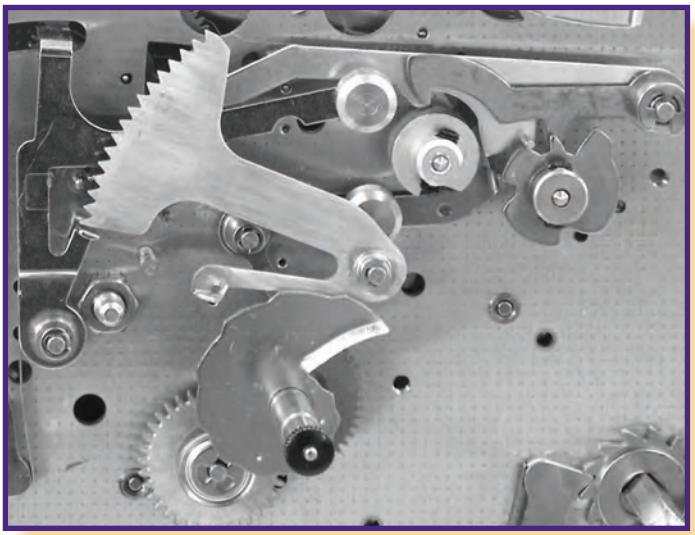

Figure 8

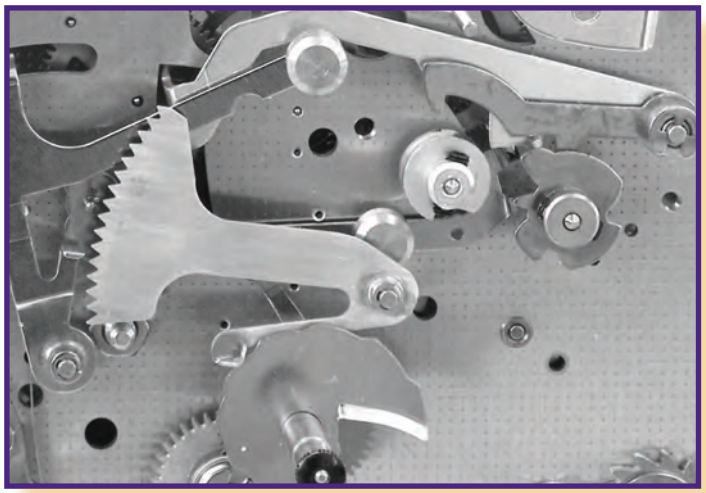

Figure 9

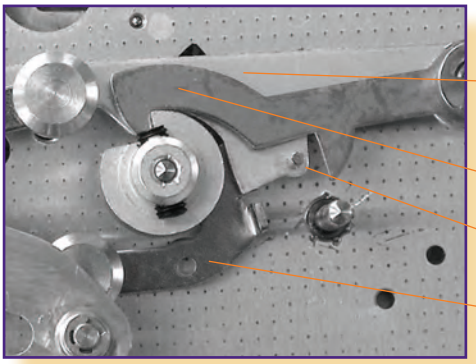

Figure 10

ing the stop lever out of the notch in the stop/correcting disk. Chiming will cease once the notch at 4 o'clock on the disk reaches the 12 o'clock position at the same time as the pin (now riding on the top of the count plate lobe) and drops into the 'after-the-first-quarter' space. The relative position of the disk and the count plate is important and is established by small grub screws. If the notch and space do not coincide, the chime will continue to run. Both hooks are sunk into the notch of the disk, although the correcting hook is the one that is actually holding the train back. At this position, the stop lever is not actually locking the train. This ensures that when the hands and the train are out of synchronization, the stop lever can be raised by the lifting piece without causing any movement of the disk, which might result in the correcting hook being released as well. It is a small point and the fault is rarely seen. However, it is safer to have the stop lever not actually holding the train when the correcting hook is in place. (The same process is seen in Figure 8, this time to chime the half hour.)

In Figure 9, the hour chime is almost finished and the raised part of the count plate lobe is lifting the stop lever/strike warning. It engages the rack hook as it lifted, and you can see the rack has fallen. The striking train is partially released and held in the warning position. As the count plate continues to rotate, the pin attached to the stop lever will drop into the space after the hour. The stop lever will fall into the notch on the stop disk and chiming will come to an end. At the same time, the stop lever, having fallen, no longer holds the strike train in warning and the striking of the hour takes place.

The positions of the disks, hooks and levers are shown in Figures 10 and 11. (The correction after the third quarter has not yet been shown.)

The Modern Westminster Chime

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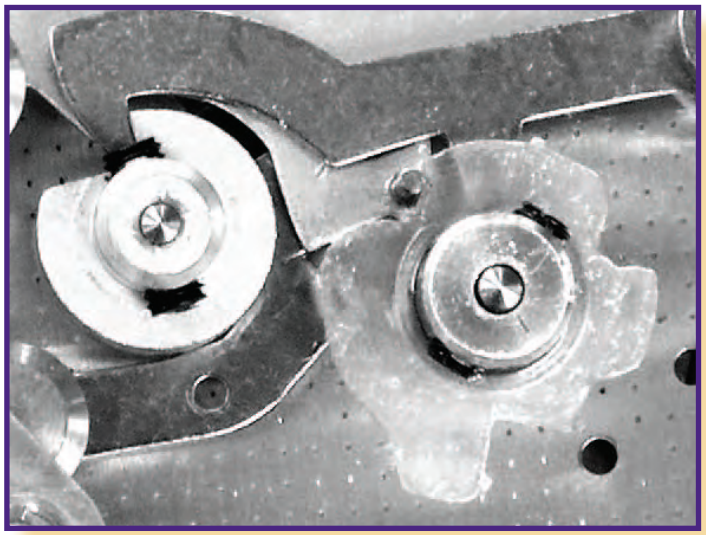

Figure 11

Correcting Function

The count plate has been removed in Figure 10 to show the stop hook, correcting hook and lifting piece. Both hooks are sunk into the notch of the disk. The correcting hook is the one that is actually holding back the train. At this position, the stop lever is not holding the train.

This ensures that when the hands and the train are out of synchronization the stop lever can be raised by the lifting piece without causing any movement of the disk, which might result in a release of the correcting hook. It is a small point and the fault is rarely encountered. However, it is safer to have the stop lever not holding the train when the correcting hook is in place.

A translucent count plate was made for Figure 11. This count place was produced so the relative positions of the count plate lobes, the pin on the stop hook, the correcting hook and the triangular locator on the correcting hook could all be seen.

Although the notch at the back of the count plate cannot be seen, its position may be inferred from the triangular locator. Its deepest point is under the tip of the triangle, and the notch extends as far as the third-quarter space on the count plate. In this case, the count plate is not set exactly right. The pin

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should be sitting securely in the deepest part of the three-quarter space. Nevertheless, the pin has fallen far enough into the space for the hooks to catch the train properly.

The lifting piece raises the hook(s) at the quarters, of course. It is raised via four pins, or four lobes on a cam at the back of the wheel that carries the minute hand. The cam is linked directly to the wheel by friction and rotates at the same rate. Three of the pins or lobes are equidistant from the center of the center arbor. The fourth is at a longer radius, so it raises the lifting piece higher than the others. This happens at the hour, and both the stop hook and the correcting hook are lifted out of the notched disk. At other times (quarter after, half and quarter before) the correction hook is not raised high enough to release the notched disk, and the chiming train remains still. The chiming is held back until the long lift occurs at the hour, and the correction hook releases the disk.

When the time indicated by the hands is out of synchronization with the chimes being struck, chiming will cease at the quarter before the hour. Neither the count plate nor the notched disk are allowed to rotate until the long lift takes place. However, this means that if the error took place when the hands were showing the hour and the chimes struck at quarter after (in other words, if the hands had been moved without allowing the chimes to operate on the quarter hour), an hour will pass before it is corrected. Depending upon the position of the error, the chime may be halted for up to three quarters of an hour. Rather than wait to make sure that all is operating correctly, it is often better to move the hands through the quarters carefully until the chiming is correct once more. Since the clock will have been stopped for some time, it should be possible to do this to correct the time shown and obtain the correct chiming sequence.

Striking

The striking mechanism is a simple rack-and-gathering pallet arrangement. The lift to the rack hook and the strike warning are operated by a bump on the chiming count plate. This count plate is almost identical in most makes of modern Westminster chiming clocks. The action of raising the striking lift and warning is carried out with a pin mounted on that lever. In Figure 10, the pin lifted by the 'bump' can be seen clearly (The count plate has been removed).

With the exception of striking and chiming trains (which are linked by the lever that stops the chimes and warns the strike), the operation of striking is much the same as in modern, mass-produced time-and-strike movements. Since they are linked, the synchronism of the parts is essential to the proper working of the movement. This is demonstrated in the list of symptoms, faults and solutions you'll find at the end of this article.

After removing the rack, the action of lifting and warning can be studied. Figure 12 shows the movement part way through chiming the hour. Both hooks have been lifted, and the pin is riding on the count plate. It has not yet reached the 'bump'. There is a projection on the chime stop and strike warning lever which is touching the rack hook and is ready to lift (shown on the left).

The next action is reached in Figure 13, where the rotation of the count plate has brought the 'bump' under the strike warning lever and lifted it. In doing so, the rack hook has been displaced and the rack, if left in place, would fall onto the snail. The strike train has been unlocked and the warning fully engaged. The striking train is waiting for the end of chiming.

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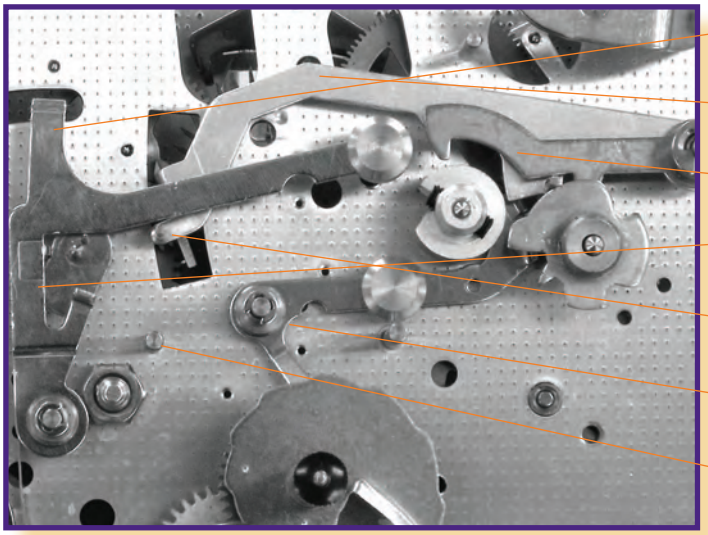

Figure 12

I replaced the rack without disturbing the rest of the train and front work. Figure 14 gives a clear picture of what has happened up to this point. I allowed the train to continue and the count plate has not finished its partial rotation. This occurs in Figure 15 where it has stopped and the stop hook has fallen into the notched disk. Because the pin that was riding the outside of the count plate is mounted in the strike warning and lift, this has fallen and the strike warning is released. Gathering begins and the rack is shown partly raised.

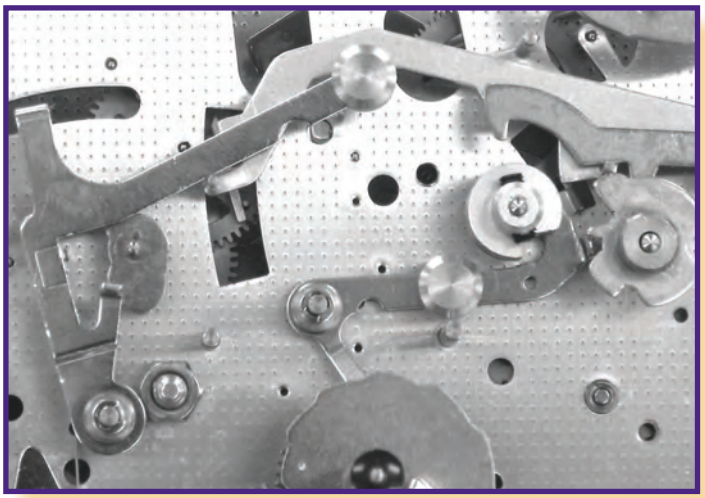

Figure 13

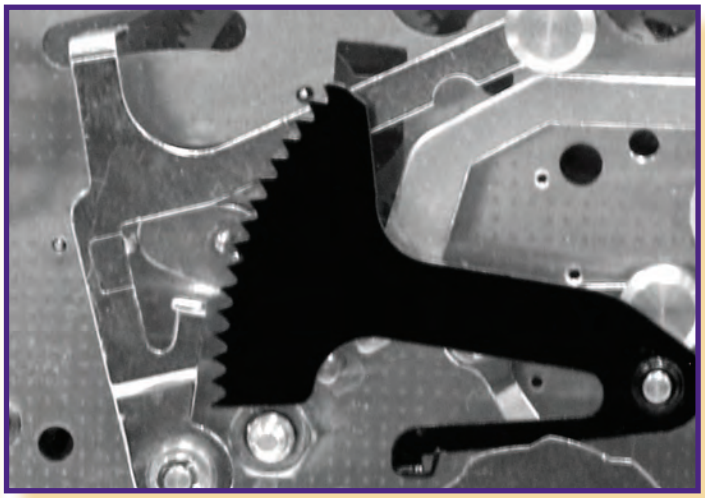

Figure 15

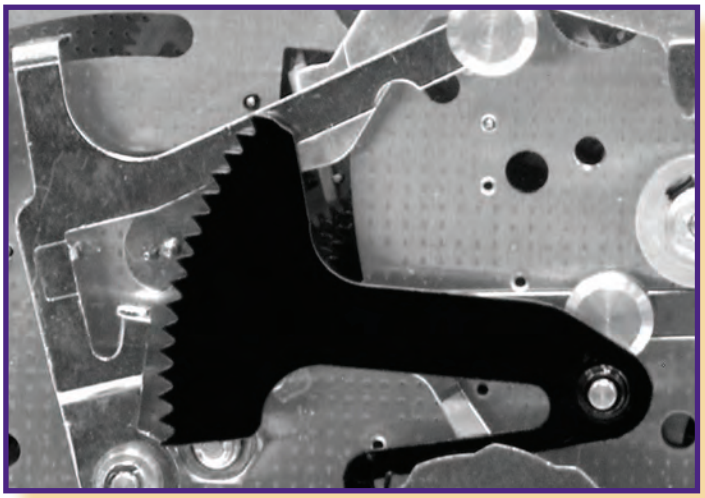

Figure 14

In Figure 16 the strike is complete. The rack has cleared the rack hook, which has fallen beneath the lower end of the rack to hold it in position. The top of the rack hook is bent in through a window in the front plate. This has been done so it can catch a pin on a wheel in the strike train and stop it when the rack hook falls beneath the end of the rack. After being stopped, the gathering pin must be clear of the rack teeth and about to rotate away from it when next the rack is released.

In this last photograph, the pin on the gathering pallet can be seen to be just catching in the teeth of the rack. In this instance, the movement at warning is sufficient to clear the pin out of the way, so that the rack drops. However, a little more engagement will prevent full striking.

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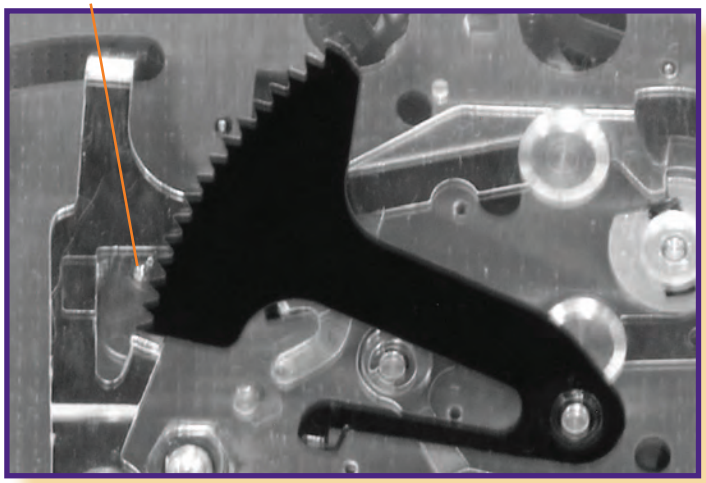

Figure 16

The gathering pallet is kidney-shaped with a lobe opposite the pin that engages the rack teeth. This lobe acts against a projection at the back of the rack hook which, at the point where the pin begins to lift the rack tooth, raises the blade of the rack hook enough to ensure it does not 'drag' on the rack while the pin is lifting. This feature is only necessary because the blade of the rack hook is simply a bent extension of the main body of the hook. It does not present an incline plane to the tips of the rack teeth as so many other movements do. However, since the pallet lifts the rack hook in this manner, there are a limited number of alternative positions for a new gathering pin if one breaks and a new insert is needed. The best place for a replacement pin that has to be relocated is slightly clockwise of the original position and almost touching it.

Notice that at the end of chiming and striking the hour, only the stop hook is engaging the notch of the stop/correction disk. The correction hook cannot engage unless the count plate (and the cutout behind it) allows it to fall.

Final Note

There are different ways of correcting chimes on clocks that play tunes or simply mark the quarters. Clocks that use a separate rack and a snail for the quarters or chimes do not need a correction device because the snail does not move on after as a chime is proceeding, as a count plate does. Consequently, at the end of the chime, the snail is still in the same position and governed by the movement of the minute hand. So, if it were required to chime again, it would repeat exactly. The only way a clock with two racks can get out of sequence for quarters or chimes is when the hand is put back on incorrectly or it's damaged.

Count plate systems may differ in detail, but the basis for correction is the same in each case. The count plate (or a part that rotates at the same rate) is provided with a pin or a cam that raises the strike warning. It is the cam that allows a loose correction hook to drop. (The cam may move a pivoted spindle with a notch cut at the center. The spindle is pivoted in a hole in the rear plate and slides from side-to-side in a horizontal slot in the front. It is spring loaded and normally prevents an inner correction hook from dropping. However, when the cam pushes the lever along its slot, the cutout at the center of the spindle allows the correction hook to fall. This is only seen in old mass-produced German clocks.)

A notched or a train wheel with a pin is positioned to catch both the stop lever and the correction lever. (The pinned wheel type usually has the stop hook and the correction between the plates.) When both the stop lever and the correction hook can fall at the same time, correction begins. The stop lever is raised by the minute-hand pipe (lobes or pins), but the train cannot be released until the loose correction hook is also raised. The raising of the correction hook is carried out at the hour by a 'long lift.' This means either one pin is further out from the minute pipe center than the other three, or one lobe is longer than the others.

It is essential that the correction hook falls freely. A clock with hooks (stop and correction) that are side-by-side will fail if old oil or dirt prevents the correction hook from falling freely. A pin or projection on the stop lever is used to raise the correction hook when it is raised higher at the hour. Pins do get bent, and then the hook may not clear the notched plate or pinned wheel.

The basic rule is to stop the train and the fall of the correction hook at the same time, so the correction hook holds the train back. A small bias to the correction is useful, as I have said earlier, but neither stop nor hook must be lifting away from engagement at the time the complementary part drops. The worst condition is when they almost coincide, and one function or the other is left just about to take place. When this occurs, the chimes will correct one time and not another, and faults will appear randomly. ♦

Common Faults

Symptom 1:
The movement neither strikes nor chimes. There are clicks, but no rotation of the fly (fan). The time is working.

The Fault
The clicks indicate that the lift is being raised by the rotation of the minute hand. Either the lift is not lifting high enough (and at the hour it certainly should be), or something is holding back the train.

Check and Correct
- Is the lifting piece bent, or are the pins in the lifting cam behind the cannon wheel damaged? Are some missing? Correct the lifting piece and repair pins.
- Is the warning blade contacting the face of the warning wheel? Bend the warning lever away from the movement plate until the blade clears the wheel but catches the warning pin.
- If the fly is moved backwards gently, does it flip back again under the pressure from the rest of the train? Look for bent teeth, pivots, dirt on the wheels, pinions and pivots.

Symptom 2:
The chimes work well, but the strike makes just one stroke every hour.

The Fault
The rack hook is not clearing the rack and allowing it to fall, or something else is preventing the rack from falling. Warning is incorrect.

Check and Correct
- Does the warning lever make full contact with the bump on the locking plate? Straighten any part of it that is bent or twisted and preventing full contact.
- Does the lever fall immediately at the hour and allow the blade to clear out of the path of the pin on the warning wheel? Clean the post of dirt, grease or corrosion. Make sure the warning lever and its blade are not in contact with the 'window' or any other part of the movement when it falls.
- Does the warning lever lift high enough to raise the rack hook and release the rack? If not, it is either bent, the post it swings on is bent, or the contact between warning lever and rack hook is

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poor. Look for a bent pin or damaged contact piece at the point where the rack is lifted.

- Is the gathering pallet allowing the rack to fall? It may have a bent pin which binds in the teeth of the rack, or it may have been replaced incorrectly so the pin does not lift out of the tooth space completely. If the extension that the pallet fits on is bent, the pin will swing through an altered circle and may hold the rack back.

Symptom 3:

The chimes start just before the hour and do not complete immediately. Sometimes, the clock stops before they do complete.

The Fault

The warning blade is not catching the pin on the warning wheel immediately. The stop hook is released. Almost certainly, this is not fair wear and tear. Somebody has bent, filed, or otherwise modified the lift/warning lever or the stop hook/strike warning lever.

Check and Correct

Any plier marks or file marks on the levers will confirm butchery. It is possible for the arbor (that the stop hook is mounted on) to wear its pivot holes and become misaligned with the warning wheel pin, but unlikely. Look for damage.

Symptom 4:

The chimes operate before the hour and do not stop until after the minute hand reaches the 12 position. There is usually no relationship between the number of chimes and the time shown.

The Fault

The warning lever is not catching the pin after the stop lever is lifted out of the stop disk and count plate. As a consequence, the clock will lose the proper sequence of chimes at each quarter. There will be periods when the chime does not occur because the correction device is holding the train.

Check and Correct

The warning lever blade must be raised sufficiently to catch the pin on the warning wheel before the stop lever lifts away from the stop disk or pin. The connection between the lifting lever and the warning lever (a single piece with two functions) is a pin on the lifting lever, or a projection made by bending the metal. A similar pin on the strike warning raises the correcting hook (Figure 17). The type with a bent-up projection on the chime warning/lift rarely gets damaged, but pins can gradually become bent. Both are subject to 'improvements' with a file. In Figure 17, the count plate has been removed to expose the pin and projection.

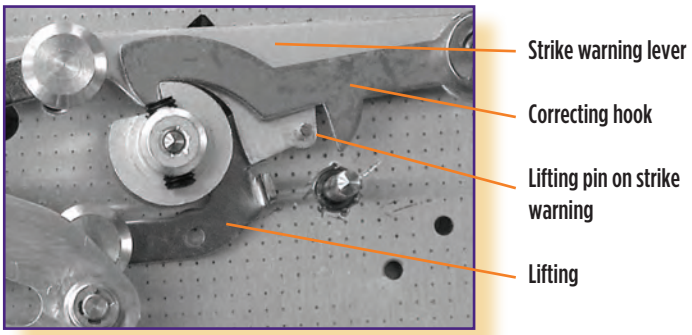


Figure 17

Symptom 5:

Once started, the strike will not stop.

The Fault

There is a damaged tooth on the rack or a bent pin on the gathering pallet. Occasionally, the stop lever barely catches the disk or pin, and once started, the striking train bumps it out of the way and does not stop.

Check and Correct

Make sure all rack teeth have the same height and that no teeth are bent, rounded at the tip or missing. Check the gathering pin. If it is bent in towards the center, it will not move the rack far enough to be caught by the rack hook, and it will fall back after each stroke of the bell or gong. Note: This only applies to chiming clocks with four or more hammers. Other German quarter striking clocks may have a rack with the first three teeth graded in height to strike quarters as a 'Bim Bam'.

Symptom 6:

The strike warns but does not strike.

The Fault

The warning lever has not raised the rack hook far enough to clear the rack teeth. If the hammers are on the rise when the train was stopped, there may be a stroke on the gong.

The Modern Westminster Chime

BY LAURIE PENMAN

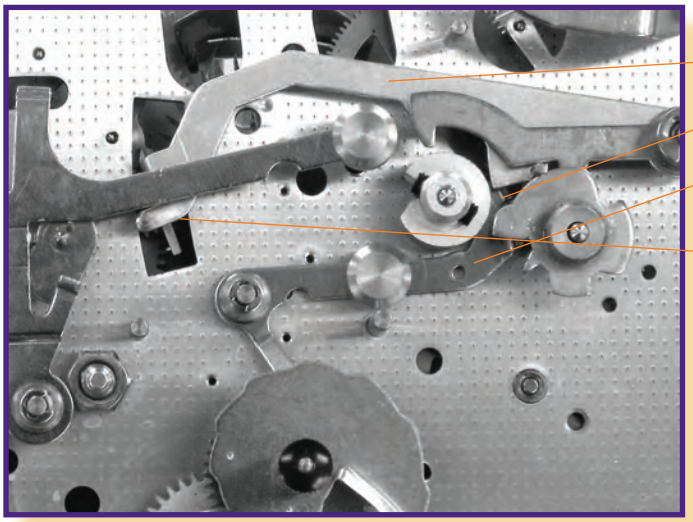


Figure 18

Check and Correct

- The pin on the end of the warning lever has been bent, or more likely, the warning lever itself has been twisted.
- The pin is not horizontal. Alternatively, the pin on the lifting piece may be bent (Figure 18).

Symptom 7:

The chimes work well, but there is absolutely nothing happening on the striking side.

The Fault

The warning to the strike is not being lifted, or the train is being held back by bent pivots, damaged teeth, or some part of the clock touching a wheel.

Check and Correct

Is the pin riding on the count plate (chime side) bent or missing? Has it slipped past the count plate? Are any levers bent so that they touch the faces of wheels? Check that power is being delivered through the train by turning back the fly to see if it turns back again crisply or sluggishly. If sluggish, move down the train, testing each wheel in turn by rotating it slightly in the opposite direction to its normal motion. If any are sluggish, the problem lies in a pivot or pivot hole lower down the train. If none are sluggish, it may be a damaged gear tooth.

Symptom 8:

Correction of the chimes is all over the place and totally chaotic.

The Fault

The correction hook is catching the disk at times other than the quarter before the hour.

Check and Correct

The notches in the disk and in the quarter-before position on the count plate must coincide precisely. In addition, the warning lever is being raised too high. Look for a twisted lever or bent pin. The correction hook is falling too far in relation to the stop hook. In the clock shown, this is governed by the pin that dies the outside of the count plate, but in those clocks with two hooks (loose correction hook and stop hook attached to arbor of the strike warning lever), the stop hook lifts the correction at the hour by means of a pin. This pin allows the correction hook to remain in place for the quarters, but makes contact on the long lift. It can become bent.

Symptom 9:

The clock does not correct the chimes, although the count plate slots and the slot in the correction disk are apparently in phase.

The Fault

The loose correction hook is not moving freely and is sticky from dirt or old oil. The pin that raises the loose hook has fallen out or been bent down. This is more likely to happen on clocks with two hooks placed within the plates.

Check and Correct

Check lubrication and the shake on the arbor or the post where correction hook is seated. Is the correction hook bent and rubbing against the locking hook or the strike warning lever? ♦

Laurie Penman has contributed his expertise to many different facets of AWCI. He has been a clock instructor and has taught correspondence courses for the Institute. In addition, he has contributed many articles to *Horological Times*. Currently, he teaches and writes from his home in Kidderminster, England.

BY DAVID CHRISTIANSON, CMW21, FAWI

QUESTION:

The owner of the watch depicted is interested in knowing where, by whom, and when this watch was made.

Orla Thomassen
Brandon, Manitoba, Canada

ANSWER:

Your watch is known as a triple calendar moon phase pocket watch with four sub-dials indicating the month, the day of the week, the date and the phase of the moon. The movement is a machine-made and machine-finished Swiss bar movement made around the year 1900. Your watch is stem-wound and pin-set. This arrangement was in common use in Europe between 1870 and 1900. The highly-polished and exposed crown wheel and ratchet wheel tells us that the watch was made closer to 1900, maybe even up until around 1905.

The crown on the case back is the crown used by the nobility in the German-speaking states and Scandinavia. Members of the nobility often decorated their personal items with their monogram surmounted by an image of their crown. In this case, however, I think that the monogram is a generic design intended to be sold as a novelty in Scandinavia and the German states of that time. The fact that the movement and dial are unsigned and that the case is of "gun metal" instead of gold or silver support this conclusion. Nobility certainly would have expected a case of precious metal and a watch of a known maker.

The Swiss makers had always made very fine quality watches, but their overall image was severely tarnished from their long and extensive production of low quality watches as they tried to gain market share during the mid-to late-19th century, when American quality watches dominated the market.

The Swiss makers at the turn of 20th century were trying to improve their image world-wide. Your watch is a good example of the quality mass-market watches that the Swiss makers were capable of producing.

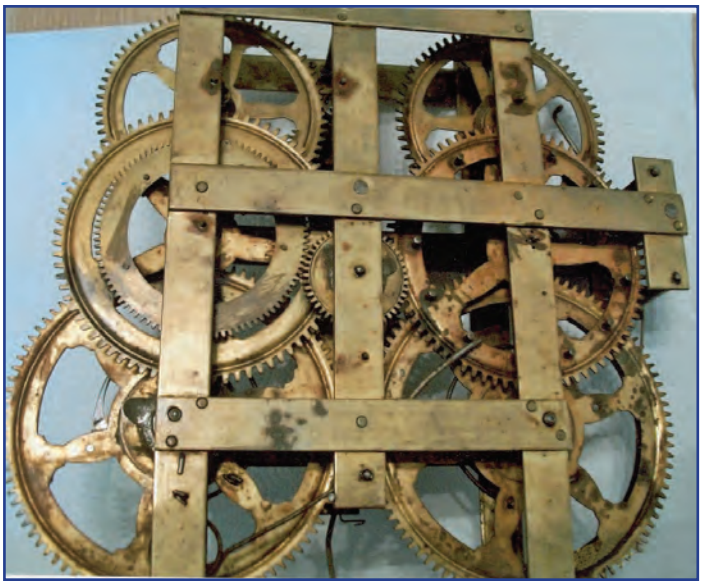
Send your Questions to *Horological Times*
701 Enterprise Drive • Harrison, OH 45030
magazine@awci.com • 866-367-2924 ext.307

BY DAVID CHRISTIANSON, CMW21, FAWI

QUESTION:

The pictured clock came in with no marking on the movement or dial. Any information would be appreciated. The case is 40 inches by 18 inches.

John D. Ingram
Oklahoma City, Oklahoma



ANSWER:

I found an identical clock on page 134 of Kenneth D. Roberts' book, *The Contributions of Joseph Ives to Connecticut Clock Technology: 1810-1862* (Ken Roberts Publications, Fitzwilliam, NH, 1988). On page 133, Mr. Roberts describes this clock as an "example of an empire style case design known as a modified 'three decker.' The large top door has a double frame for the dial glass at the top and a tablet below and is flanked by round veneer columns. The smaller bottom door contains a tablet and is flanked by vertical OG projections. The top of the case is...a carved splat held between two pedestals. The base is supported by ball feet. The style of case was introduced in 1834 or 1835 and thereafter was more commonly made than the standard 'three decker.'"

Your clock was made by Birge, Gilbert & Co., successors to Birge, Case & Co. of Bristol, Connecticut. The brass strap movement is a Joseph Ives design that was originally developed by Ives somewhere around 1828. The unique plate design and wheel crossings help identify this movement and its maker. Birge, Gilbert & Co. succeeded Birge, Case & Company until about 1835. With this information I can place the time of your clock's manufacture during the mid-to-late 1830s.

Certification: Two Observations

Jerry Faire, CMC21

My certification appears on all my advertising to show my customers I am really serious about the work I do! This usually results in the customer finding us when they want the "best qualified" person to deal with their products. Certification gives the watchmaker or clockmaker the opportunity to meet and visit with the customer face-to-face, and when you're certified, you're more likely to draw in the type of customer who really wants to know about his or her product.

Each time a customer comes in, I carefully explain to them what I can offer, and let them choose. This typically results in more work, such as case or dial work, and it gives me a chance to communicate my knowledge to the customer. I can share the AWCI Standards and Practices with my customers and show them not only what it is, but why I follow it and what that means to the quality of the work I am offering. The knowledge and skills I have gained through the certification process have given me the opportunity to offer even more services to my customers. Additionally, the customer gets the peace of mind that their prized possession is being cared for properly by a worker whose competency is recognized by other professionals in the field. When times are tough and money is tight, customers will usually seek out the most competent workers in a field.

As a professional glassblower once said, "Skills pay bills." Certification gives you a chance to show off those skills, and I feel it has given me a chance to charge better prices, as well.

Bob Metheny, CW21

Other watchmakers used to tell me that there were state-administered watchmaking exams, similar in concept to a CPA or Medical Board Exam. These exams were mostly taken by recent graduates to test their knowledge of their respective professional expertise. The objective of these exams was to ensure that only those with a proper theoretical and practical knowledge would be granted the credentials to practice their craft. The advantage of obtaining this type of credential was twofold: First, it showed to fellow craftsmen that you had achieved a verifiable level of knowledge; second, it informed the public that a qualified individual was available in their area. These exams showed consumers that they could entrust the repair of their timepiece to the individual with the assurance that all work would be done properly.

With the passage of enough time, it was inevitable that this examination process deteriorated. It was discarded and virtually no verifiable, quality benchmarks remained. The proliferation of the "basement watch tinkerer or hobbyist" further eroded the reputation of horology as a profession and eroded the earning potential. When I graduated from the old Bulova School of Watchmaking on February 2, 1980, they were proud to state that there was guaranteed employment with a starting pay of $10,000 per year. How pathetic to earn such a paltry sum when interest rates on a 30-year mortgage were around 22%!

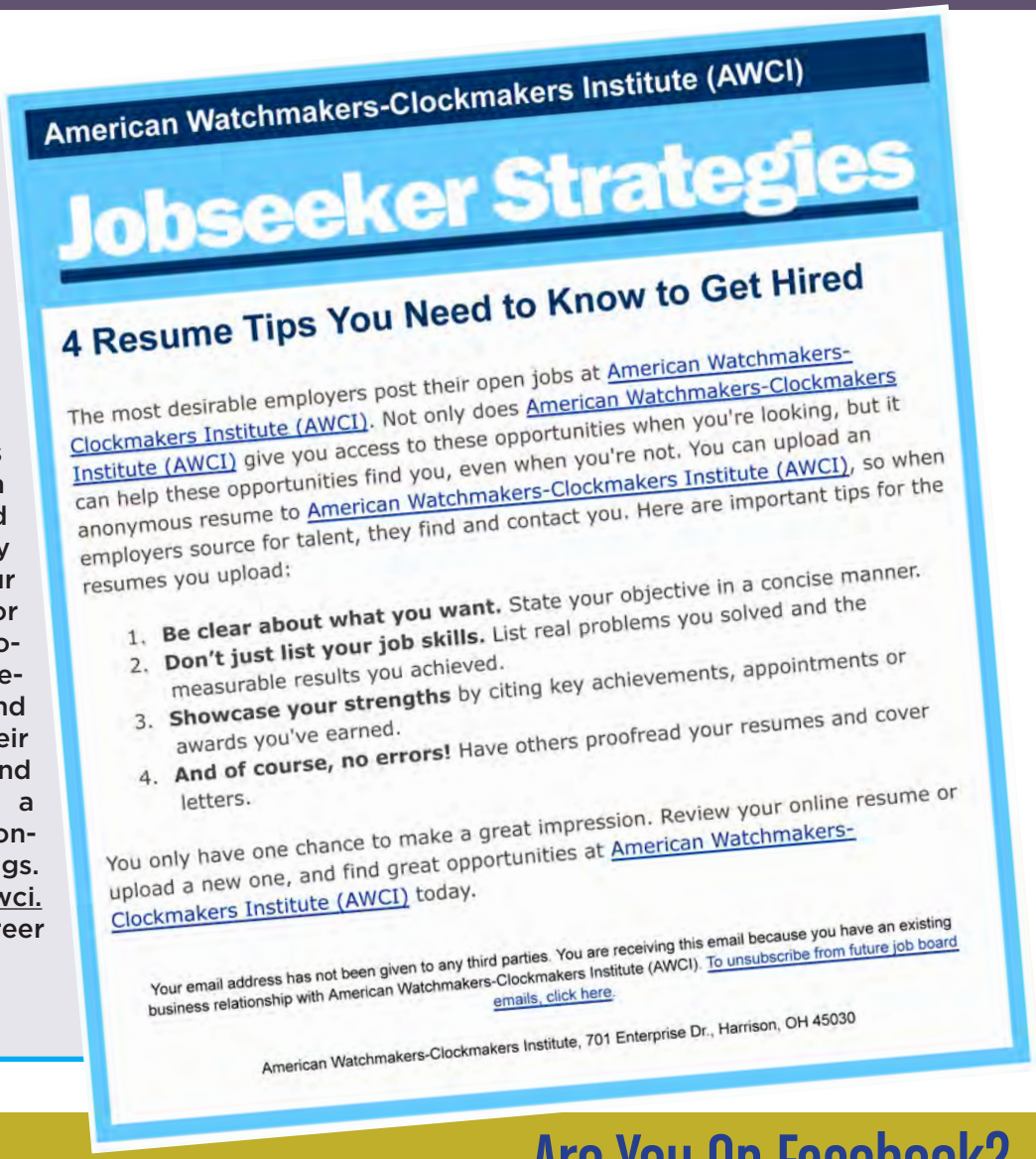
The CW21 Exam has had a positive impact on my professional career. It was the vehicle which enabled me to have my Spare Parts Account reopened. Without my certification, reactivation would have been absolutely impossible! Furthermore, a local, Official Rolex Jeweler has entrusted me with all their Rolex repairs, and I also do some of the more obscure and difficult repairs for another Official Rolex Jeweler located in the Midwest. Approximately 50% of my income is currently derived exclusively from these 2 sources. This gives me the freedom to decline some of the more "challenging" repairs which, until recently, I've been compelled to tackle on a regular basis.

Yes, the CW21 exam was difficult. The time constraints during the examination itself, the cost, and the uncompleted work piling up at my shop due to being closed for a week, all added up to a healthy dose of extra pressure during the testing process. It was difficult, at times, just to keep my attention keenly focused! I also had no way of knowing at the time whether or not obtaining my CW21 would help get my Spare Parts Account reopened. Luckily, it did.

I believe *anything lightly obtained is quite often lightly esteemed*. Anything difficult is not a joy to go through, but if you pass it and additionally do well, it truly is an accomplishment to be justifiably proud of! ♦

Career Resources
Visit AWCI's Online Career Center

Are you looking for a job, or do you have one to offer? With over 250 registered employers and over 300 registered jobseekers, AWCI's easy-to-use online Career Center provides a space where industry professionals can connect. Through the Career Center, employers can insure their job postings reach the most skilled watch and clock professionals, and candidates can perform a truly targeted job search. Post your resume, search the listings, or set up a personal alert to notify you when a new job becomes available. Students and AWCI members can post their resumes for free. Employers and job-seekers can also select a package that includes both online and *HT* classifieds listings. Visit our website at www.awci.com, then, click on the Career Center to register.



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1. **Be clear about what you want.** State your objective in a concise manner.
2. **Don't just list your job skills.** List real problems you solved and the measurable results you achieved.
3. **Showcase your strengths** by citing key achievements, appointments or awards you've earned.
4. **And of course, no errors!** Have others proofread your resumes and cover letters.

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There's no better place to find immediate information on recent events than the American Watchmakers-Clockmakers Institute Facebook page. You'll find everything from events to PowerPoint presentations to links to articles. Right now, for example, you can find the entire PowerPoint from Witschi on *Quartz Know-How for the Professional* which many people have asked to view. We'll also have ongoing updates on the upcoming convention. *Like Us* so we can continue to double our weekly visitors! It's a great way to stay updated on events in the watchmaking-clockmaking world. (Yes, we're definitely including info for our clockmaking friends, too!)

Ohio Affiliate Chapter Welcomes Members to Convention

The Watchmakers/Clockmakers Association of Ohio (WAO) invites all AWCI members to attend its annual convention in July. This three-day event will feature numerous educational and networking opportunities within a picturesque setting deep in Ohio's Amish country.


Mark Baker, Presenter

Watchmakers Clockmakers Association of Ohio
65th Annual Convention
July 22-24, 2011
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www.carlisleinns.com


Tom Schomaker, Presenter


Michael Gainey, Presenter

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Mark Baker, CMW, CC21

Current State of Contemporary Black Forest Cuckoo Clock Manufacturing, Music Boxes and Associated Repair Issues
Mike Nestell

Watch
How to Quality Control a Finished Watch Repair
Tom Schomaker, CMW21

Registration
For more information, including complete convention schedule and fees, please contact Michael Gainey at 614-833-0378 or via email at mjongainey@hotmail.com.

Membership in WAO is not required.


The Carlisle Inn "Deep in the Heart of Ohio's Amish Country"

in remembrance

Lenny LeBeau in his Florida workshop.

Leonard "Lenny" LeBeau, a charter member and a Certified Master Watchmaker, passed away in March. Lenny graduated from the Elgin Watchmakers College in 1940, and he and his wife, Bernadette, were the owners of LeBeau Jewelers in Kentland, Indiana, for 42 years. Lenny stayed active as a watchmaker and continued repairing watches through his 95th birthday.

Lenny was a registered jeweler and a member of the American Gem Society. Additionally, he was a past president of the Indiana Watchmakers Association, a member of the Florida Watch and Clockmakers Association, and belonged to the National Association of Watch and Clock Collectors (NAWCC).

A World War II veteran, Lenny served in the United States Army from 1941 to 1945. He was stationed in the Pacific Theater. During his time in service, Lenny was awarded the Asiatic-Pacific Theater Ribbon with Bronze Star, the American Theater Ribbon, the American Defense Service Medal, the Philippine Liberation Ribbon, the Good Conduct Ribbon, and the World War II Victory Medal.

Lenny's son, Richard LeBeau, shared the following story about his army—and early watchmaking—experience. Lenny was a Master Sergeant stationed in the South Pacific in the 134th Army Ordinance. He repaired watches, binoculars and other equipment. Once when a ship's chronometer needed repair while he was on board, he told the officers all he asked in exchange for fixing the chronometer was a fresh water shower (fresh water showers were available for officers only). They were much obliged and he was granted his shower.

Lenny was also active in his community. He received the Sagamore of the Wabash award from Indiana Governor, Robert D. Orr in 1983. He was a member of the Knights of Columbus third and fourth degree and was also active in Rotary Club and his neighborhood Catholic Church.

Lenny is survived by his wife, Bernadette, his seven children, 16 grandchildren and 15 great-grandchildren. AWCI will miss his tireless support of the organization and his dedication to the horology profession.

Lenny was a big Tampa Bay Ray's baseball fan and never missed a game.

AWCI new members

California
Antonio Ordaz-Covina, CA*
Mario Rodriquez-Los Angeles, CA*

Colorado
Rusty Tuggle-Glenwood Springs, CO*

Florida
Ari Kesler-West Park, FL
Ricardo Suarez-Miami, FL
Josh Zohar-Aventura, FL

Illinois
Fozi Yousuf-Chicago, IL

Kentucky
Ray Bacher-Alexandria, KY

Massachusetts
Gail M. Smith, CMC-West Dennis, MA*

Mississippi
Jacques S. Sollberger-Ridland, MS*

New York
John Anthony Sorriento-Troy, NY*

Pennsylvania
David G. Arnold, CMC-Harrisburg, PA

South Carolina
Dr. Jack W Bonner, III-Greenville, SC*

Tennessee
Lenny Plotitsa-Memphis, TN*

Texas
Moon Choe-Fort Worth, TX
Robert D. Gates-Baytown, TX
Mark Thomas Myers-Irving, TX*
W. P. Neblett, CMC, CMW-Dallas, TX*

Virginia
Guido C. Alave-Vienna, VA*1

Ontario
Stephen Evely-Torronto, ON

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

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Knowing how to properly repair watches and clocks saves time - while also generating additional traffic and profits. It also helps to protect and enhance the brands you promote as well as your reputation and integrity. Expertise through formal training is available through AWCI, and demand is growing! We invite you to learn more about the CW21 and CC21 certification programs now available and hope that you will be as excited as we are about our other certifications currently under development.

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AWCI regrets to inform you that the Alessandro Betti class scheduled for May 16 through 20, 2011 has been canceled due to circumstances beyond our control. However, AWCI is offering a wide range of other classes this year. Sign up now for Kari Halme's special class in June or one of our new classes on the Modular Chronograph or Polish and Waterproof Testing later in the year!

AWCI Academy of Watchmaking Class Schedule

AWCI is offering a series of 5-day watchmaking classes. Each 5-day block will cost $725; 3-day block is $435.00. All classes are held in Harrison, OH. For additional information call toll-free: 1-866-FOR-AWCI (367-2924), ext. 303 or e-mail education@awci.com. Class information is also available online at www.awci.com.

May 9 – 13, 2011	Basic Watch Repair
June 13 – 17, 2011	Servicing & Adjusting the Modern Automatic Chronograph
June 27 - July 1, 2011	Special High-Grade Automatic Class with Kari Halme - Title still to be announced. *This will be a VERY advanced class with strict prerequisites.*
Sept. 12 – 16, 2011	Servicing & Adjusting the Swiss Lever Escapement
Sept. 26 – 30, 2011	Balance Staffing & Timing
Oct. 10 – 14, 2011	NEW Class! Modular Chronograph (*Featuring* the Vertical Clutch System)
Oct. 17 – 21, 2011	NEW Class! Polishing & Waterproof Testing

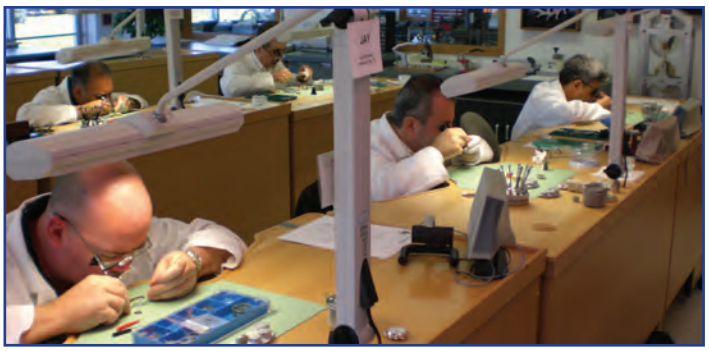
AWCI Watch Repair Course schedule is subject to change. Seats may become available for the classes; please contact AWCI to be added to the waiting list.

AWCI 21st Century Certification Exam Schedule

Visit AWCI's website for complete information on the 21st Century Certified Watchmakers Exam. To register for an exam or for more information call toll-free: 1-866-FOR-AWCI (367-2924), ext. 303 or e-mail education@awci.com.

May 23-26, 2011 AWCI Training Facility, Harrison, OH
June 20-23, 2011 AWCI Training Facility, Harrison, OH
July 11-14, 2011 AWCI Training Facility, Harrison, OH
August 8-11, 2011 Lititz Training Facility, Lititz, PA
August 15-18, 2011 N. Seattle Community College, Seattle, WA
September 19-22, 2011 AWCI Training Facility, Harrison, OH
October 3-6, 2011 AWCI Training Facility, Harrison, OH
November 7-10, 2011 AWCI Training Facility, Harrison, OH
December 12-15, 2011 St. Paul College, St. Paul, MN

Please Call AWCI for Available Dates.



The AWCI Watch Certification schedule is subject to change. Seats may become available for the exams; please contact AWCI to be added to the waiting list.

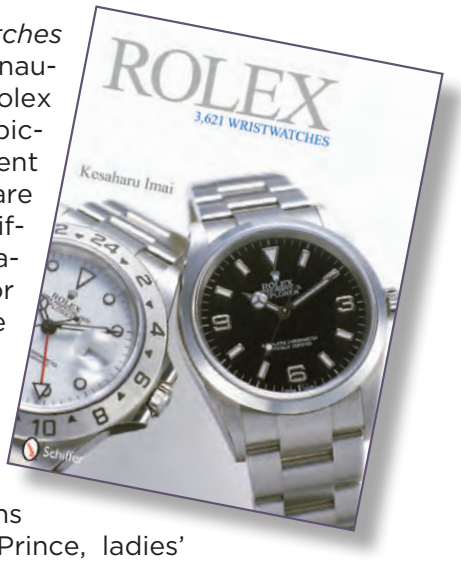
BY RON LANDBERG, CW21

Schiffer publishing has a large catalog of hardbound, coffee table style books and an extensive part of their collection features watches and clocks. These books are generally readily available from book stores and websites. If you're interested, you can see the different titles, authors, and a brief description of each on the Schiffer website at www.schifferbooks.com.

Vintage Rolex Sports Models, Martin Skeet and Nick Urul

Vintage Rolex Sports Models, an unauthorized comprehensive and detailed visual reference, was published in 2002. In 2008, the third edition was released, adding approximately 48 pages. Martin Skeet and Nick Urul know their watches and provide the reader with an enjoyable unauthorized history of some of the most sought-after collectible watches in the world. There are sections or chapters, based on the different sports models, discussing the changes chronologically with great photo examples, starting with the Submariner. Dial and hand changes, along with bezel and crown guard changes are all covered. This book has helped me identify watches which have been pieced together in an attempt to add value inappropriately. There are over 140 models from between 1952 to 1990 which are described. Photos of watch boxes, hang tags, watch documentation and everything else you can imagine are included. If you are a Rolex sports watch collector or admirer, this book is a must have for your collection. The pictures alone are worth the purchase. Both Martin Skeet and Nick Urul live in London where Nick is a well-known internationally recognized watch dealer, and Martin is an expert on Rolex sports models, especially diving watches.

Rolex 3621 Wristwatches, Kesaharu Imai



Rolex 3,621 Wristwatches is another great unauthorized book on Rolex watches, containing pictures of over 14 different model lines. There are many pictures of different watches separated by reference or model number; the book gives a great deal of information on the variety of Rolex watches in the market. Kesaharu Imai includes sections on Non-Oyster, the Prince, ladies' watches, pocket watches, the Air-King, the Bubble Back, and even Quarter Century models, as well as the sports models. There's not much actual copy, but it takes quite awhile to look at all the watches with their extensive descriptions and information. Kesaharu Imai is a Japanese watch expert living in Toyko and is an editor for the World Photo Press.

Vintage Watches Highlight at the 16th Annual Las Vegas Antique Jewelry & Watch Show: June 2nd-5th, 2011

U.S. Antique Shows, a major producer of antique shows, will be showcasing collections of antique, estate and vintage jewelry and watches at the 16th Annual Las Vegas Antique Jewelry & Watch Show. The show is scheduled to kick off on June 2 through 5, 2011 at the Paris Hotel, Las Vegas. This event will feature some of the most magnificent antique jewelry, gemstone and watch collections worldwide.

"This is the largest show in the U.S. devoted to the antique and estate jewelry and watch trade with more than 300 dealers. We provide an upscale show with the most established dealers in the world where buyers know they can find rare, one-of-a kind pieces and acquire amazing merchandise in a professional setting," said Andrea Canady, fair director for the Las Vegas Antique Jewelry & Watch Show.

Pieces from all periods throughout jewelry history, Edwardian to Art Deco Vintage and Retro, will be available at this four-day event.

Unique items available at the show include a vintage, circa 1915 Gubelin pocket watch in platinum with gold hands and numerals, which is represented by Excalibur.

Show hours are from 11:00 a.m. to 7:00 p.m. June 2-4 and from 11:00 a.m. to 4:00 p.m. on June 5th. A one-time admission fee of $15 is valid for all four days of the show.

Gubelin pocket watch in platinum with gold hands and numerals—Circa 1915—Represented by Excalibur

Portable Pocket Scale Ready When the Opportunity Arises

A new, highly accurate portable pocket digital scale that is ready to weigh jewelry and other items up to 300 g (10.58 oz) whenever the opportunity arises, is being introduced by Alliance Scale, Inc. of Canton, Massachusetts.

The Alliance/OHAUS YA302 Pocket Scale is ready for weighing all types of items up to 300 g. It provides 0.05 g accuracy, and can read out in g, oz, ct, and gn on a bright blue backlit LCD display. Powered by two AAA batteries, it features an automatic shut-off, low battery indicator, a stainless steel pan, stability indicator, and rugged plastic case with a hinged cover.

Ideally suited for weighing gold and other fine jewelry, the Alliance/OHAUS YA302 Pocket Scale only measures 2.75" x 3.875" x 0.875", making it easy to store in a pocket, purse, briefcase, or glove box. The stainless steel platform measures 2.50" x 2.63" and the scale stabilizes within 2 seconds. This pocket scale is also great for use in schools, claims the firm.

The Alliance/OHAUS YA302 Pocket Scale sells for $37.00 and is available online at www.alliancescale.com.

classified advertising regulations & rates

Ads are payable in advance $1.00 per word, $1.10 per word in bold type. Classified display ads are $45.00 per column inch, 2¼" wide. Classified ads are not commissionable or discountable. Payment can be made by check, VISA, MasterCard, Discover, Diner's or American Express. The publisher may, at the publisher's sole discretion and for any reason and without notice, decline to publish or republish any ad, in which case any fees submitted or paid for such ads shall be returned or rebated to the advertiser. The publisher reserves the right to edit all copy. Price lists of services will not be accepted. Confidential ads are $15.00 additional for postage and handling. The first of the month is issue date. Copy must be received 30 days in advance (November issue closes for copy on October 1st).

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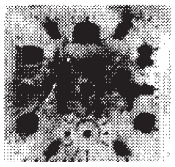

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