

HOROLOGICAL TIMES™

ADVANCING THE ART, SCIENCE & BUSINESS OF HOROLOGY
February 2014



AMERICAN WATCHMAKERS-
CLOCKMAKERS INSTITUTE

The Case Issue

Repairing a Silver Hunting Case

The Best Products and Techniques for Refurbishing Wooden Clock Cases

Certification Update

How to Use the Lathe's Back Gear as a Spring Winder

A Look Back at the Development of the **Gruen Watch Company**



Official Publication of the American Watchmakers-Clockmakers Institute

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When Bob Little received this clock, it was in pieces and badly mildewed. Find out how Bob refurbished this clock and what products and techniques he recommends for repairing wooden clock cases on page 32.

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Horological Times Advertising Policy & Editorial Policy

Dear AWCI Members,

The Board of Directors of AWCI, by the request of our advertisers, recently passed a motion defining an advertising policy and standards for *Horological Times*. The objective of this policy is to promote the use of genuine parts, to encourage higher quality workmanship, and support certification. This policy helps to ensure that AWCI consistently presents a professional image through its magazine. We recognize that restrictions on the sale of genuine parts have created an increased demand for non-genuine parts. Nevertheless, allowing the advertisement of non-genuine parts endorses their use and reflects poorly upon our industry and our members. We will continue to regulate the advertisement of non-genuine parts in an effort to promote the use of genuine parts whenever they are available and to encourage their fair distribution.

Advertising Policy for the Horological Times

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

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

Publisher's Standards

AWCI makes a concerted effort not to publish any advertisement which promotes or depicts practices not in harmony with our professional Standards & Practices for Watchmakers & Clockmakers. The advertisement of generic parts, tools, and materials is allowed when such advertisement does not possess any trademarked image, brand, or name. Advertisers can refer to the items by name, function, quality, size, and description but shall not indicate that the parts are generic, aftermarket, or non-genuine. Phrases like "to fit [brand name]", "[brand name] style", and "generic" are not allowed. Genuine parts can be advertised as such in accordance with the advertiser's relationship and agreement with the manufacturer. We encourage advertisers to reach out to our members and market goods & services which will help them to professionally service their clients and represent themselves in a way which will "reflect positively on him or her, on the AWCI, and the entire watch and clock repair industry, including all of its participants." – AWCI Code of Ethics



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I talked last month about how important it is for us to adhere to high standards, and I offered solutions to the labor shortage of some watch companies and methods of having a win-win situation for independent horologists as well as the manufacturers. This month, I will discuss the role of the sales division in our arena.

For those of us working at the bench, our professional world is usually relegated to about one-quarter of the circle of what is immediate-

ly in front of us, that is, the service aspect. The other three-quarters is made up of research and development, design, production, marketing, and distribution and sales of the new product. We choose to support what is at the very end, *after-sales* service, therefore *supporting* the sales. Therefore, our role in the larger equation is as important as those who are in the other three-quarters of the circle.

We help maintain the manufacturer's product that was intended to last a predetermined period of time. Each brand and manufacturer has different philosophies and approaches that may not always be the same. However, each brand has calculated a certain "cradle to grave" period for the said product.

Experienced companies with long-term goals understand the importance of after-sales service, also known as "service après-vente" in French, or SAV for short. Therefore, they continue to incorporate details that make it simpler and easier to perform the SAV function either by their own facilities or independent agents. These details include efficient parts stocking and distribution, intelligent design of cases and bracelets that are relatively easy and expedient to refinish and maintain as new, and solid and properly designed movements that function well and are relatively easy to service. All these details add up to a solid product that is desirable, functions well, and is easy to service.

If we, as highly skilled technicians, perform our tasks to within industry standards, and all the aforementioned entities do so as well, then you might surmise that the entire machine performs smoothly. However, it gets a bit complicated.

In this message, my focus is on the *sales* divisions of brands and the perceived power they wield. The sales divisions of some brands hold a certain "importance" or hierarchy within their companies. Often, sales reps are the "go-to" persons for the retailer/dealer to get a certain task accomplished or to receive certain privileges. After all, if sales of new products are threatened or perceived to be threatened, it becomes easier to bend rules or bypass standards. Unfortunately, bypassing quality standards and bending rules and guidelines does only one thing—erode the quality of the service. As mentioned in several of my previous messages, if service and sales are inextricably linked, this will affect the overall image of the product and therefore reverse the efforts the marketing department has painstakingly worked to create. Only when service and sales are together and on equal standing will the product have a chance to succeed and flourish.

For example, a somewhat similar industry, the automotive industry, faces similar challenges, but some car brands have instituted strict guidelines—specifically, the sales division is in fact a stalwart supporter of the service division. Should a retailer be caught bypassing industry standards during after-sales service, or if a car they serviced that will be sold as "factory certified" pre-owned is found not to meet approved standards, they are ultimately warned by the sales division of the brand. The sales division looks at this violation as cause for deep concern, knowing it will eventually affect their overall

brand image and, therefore, total sales. Corrective measures are then taken.

Just as in the auto industry where various brands are found side by side on "auto alley," so are various watch brands found side by side in many retailers and dealers. Competition can be fierce, and the survival of the brand is always at stake.

Understanding and respecting those who work to high standards will help grow sales, and a byproduct of this is the creation of a healthy and vibrant independent SAV network. The promotion of double standards by the brands, which favor some retailers over those who have embraced the highest of standards of workmanship, will inevitably hurt everyone in the industry.

In the meantime, keep your skills honed, your standards very high, your attitude professional, your tools and equipment in great condition, and your workshops clean and organized—this is the only way we will excel.

Bypassing quality standards and bending rules and guidelines does only one thing—erode the quality of the service.



A Financial Update

I know our membership is eager to know what has been accomplished at AWCI since I started as Executive Director. At the time of this writing, we just finished closing out the first half of our fiscal year, and I just want to give a quick financial update to let you know of the progress that has been made.

As of December 31, 2013, net profit for AWCI was \$62,000 despite having budgeted a loss of \$116,000.

Some of the factors that have allowed us to perform so much better than we had budgeted are less-than-expected expenses related to staff changes at headquarters, many little changes that have allowed us to save in areas such as utilities, taxes, and heating/cooling, as well as more-than-budgeted revenue for classes and advertising. This is in great part thanks to generous in-kind contributions from Industry to help us continue offering classes as we look for a full-time instructor. You will see an ad in this magazine for the position of watchmaking instructor. If you or anyone you know may be interested, spread the word. AWCI has a beautiful educational facility and provides an excellent opportunity for someone who is passionate about this profession to share their knowledge with other clockmakers and watchmakers.

As of December 31, we owe \$518,000 on our mortgage and have an outstanding line of credit of \$279,000. One year ago the outstanding balance on the mortgage was \$547,000, and the line of credit was at \$348,000. Just four short months ago, the line of credit was at \$475,000.

The Midyear Meeting

As you are reading this, your Board of Directors is preparing to travel to Florida for the midyear meeting of the Board of Directors on February 12. Last year's midyear meeting and this year's annual meeting focused on the immediate future of AWCI. In addition to the necessary motions to prepare for the publication of a budget and preparing for an election

and the annual meeting, the focus of this meeting will be on the long-term future of AWCI. An emphasis will be on which programs to expand and develop vs. which ones should be changed or eliminated. Also on the table will be the topic of the membership structure of AWCI—whether it can or should be changed to better benefit our members as well as attract more individuals into our organization. As members, your feedback on this topic is greatly needed. Please email or call your board members so that they know what are your concerns going into this meeting. Their individual emails are located at the front of this magazine, or you can reach the entire board at awciboard@awci.com.

A Survey

The future of AWCI is in your hands. This organization belongs to each of you. The building, the classrooms, the employees are all here because of each of you, our members. We want to know how we can best serve you and how we can best attract more members to participate in our organization. We have developed a short, seven-minute survey that can be taken online. It asks you to rate the value you place on our current programs as well as some possible future programs that have been considered for implementation. Please take the time to fill out this survey and let us know what you value about AWCI. Note: This survey is not just for members. Please share the link to this survey with your friends and colleagues who are involved in the horological professions. Their feedback will help us better understand why they are not members of AWCI and what we can do differently to attract them into our organization. Share the survey on facebook, in discussion forums, and via email with anyone involved in our profession.

AWCI is in an excellent position right now and is poised to grow and develop. Please be a part of your future by taking seven minutes to take a quick survey.

AWCI is
poised to
grow and
develop.



www.awci.com/about-us/survey

AMERICAN WATCHMAKERS

AWCI continuing education courses are designed to help professional watchmakers continually improve their skills and stay current on changes in recommended service techniques. We are offering a combination of refresher courses, advanced level courses, and courses designed to prepare individuals for the CW21 (Certified Watchmaker) Exam. Previous work on watches in a watch repair environment is recommended—for example, self employed, factory service center, independent service center, or store manager.

Not sure which course to sign up for? Please log on to our website and fill out the Professional Experience Questionnaire. Contact us so we can help you find the best course suited to your skill level, expertise, and interests.

Don't see the course you want here? We are always trying to expand and improve our course offerings and we welcome suggestions. We may also have a course already developed which isn't scheduled, and we can try to accommodate you.

Looking for someone to come to your business, chapter, or guild to teach a course? We do that too. Please contact our education coordinator for more information.

Polishing, Case Refinishing, and Water Resistance Testing (MARCH 10-13)

Polishing a watch today requires many skills. Complex case and bracelet designs are common in the marketplace. Today's consumer has high expectations concerning the quality of the watch repair which includes the refinishing of the case and bracelet. Knowledge is the key.

This course will be taught by instructors from the Lititz Watch Technicum and includes concepts and hands-on training in the following areas:

- Casing information
- Case and bracelet refinishing
- Metallurgy
- Lathe finishes
- Use of modern variable speed polishers
- Modern polishing techniques ensuring case shape integrity
- Water resistant testing

This course is designed to help you realize:

- A higher quality of service
- Reduced comebacks due to moisture issues
- Faster turnaround time
- Higher customer satisfaction

Introduction to Watchmaking I (MARCH 24-28)

Everyone you talk to is interested in what you do. They see your passion and your dedication. This course is an opportunity for each of us to share this passion with those we work with.

Introduction to Watchmaking I is a class which gives a basic knowledge of what we do with an emphasis on professionalism. This class is a little different from the one-day (or weekend) course where you take a pocket watch movement apart and hopefully get it back together again. This class covers not only disassembly and assembly but the importance of cleanliness and oiling.

This class is perfect for anyone considering a profession in watchmaking, for sales people who want to be able to speak more professionally with their customers about what is involved in watch servicing, and for industry professionals hoping to become better acquainted with the work of a professional watchmaker.

We don't make watchmakers in a week but we can help individuals become passionate about watchmaking, and help them understand the importance of the standards and practices being implemented by the Industry today.

The Introductory course is designed for individuals with very little or no watchmaking experience. If you know somebody who is interested in the profession this is the course for them.

Basic II is for individuals who have experience with disassembly and assembly and/or have been working on watches, but not professionally.

Basic III is for individuals who have been working on watches but do not have formal training and would like to start the continuing education process to raise their proficiencies to meet those required by the Standards & Practices of AWCI and the Industry as a whole.

Basic Watchmaking I, II, and III are hands-on courses that provide the essential feedback from an instructor that you can't get learning watchmaking from a book or on the Internet.

We hope to see you, your friends, and your associates in our classroom soon!



CLOCKMAKERS INSTITUTE

FEBRUARY 11-12

Midyear Meeting of Board of Directors

FEBRUARY 24-27

Refresher Course

MARCH 3-5

CW21 Exam
AWCI
Harrison, Ohio

MARCH 10-13

Polishing, Case Refinishing, and Water Resistance Testing



MARCH 24-28

Introduction to Watchmaking I

APRIL 7-10

Basic Tool & Spare Parts Making - Level II

The second course in this series designed for both clockmakers and watchmakers is a more customized program to further your micromechanical skills. You will be designing and making a dead beat escapement for the Hermle 77 movement.



APRIL 14-17

Modern Mechanical Chronograph - ETA 7750

This course focuses on the service and adjustment of modern mechanical chronographs like the ETA 7750 and is the perfect course for anyone preparing for the CW21 Exam. Students should have a solid understanding of basic service procedures as this course will focus on the chronograph mechanism itself.

MAY 5-8

The Art of Watch Adjusting: Escapement, Timing, and Oscillator Work

This intense 4-day course will help you refine your adjusting skills. The course covers all of the adjustments for the Swiss lever escapement, hairspring, and balance. Also covered is balance staff replacement, poising, and adjustments for classic oscillator systems with flat or overcoil hairsprings, as well as the ETACron system.

MAY 12-14

CW21 Exam
OSU
Okmulgee, Oklahoma

MAY 19-22

Basic Watchmaking II

JUNE 16-19

Basic Watchmaking III

JULY 7-10

Basic Tool & Spare Parts Making - Level III

The third course in this series designed for both clockmakers and watchmakers allows you to refine and showcase your micromechanical skills through further miniaturization. Designed for students who have mastered the skills of the first two courses, you will design and manufacture a 3/4 plate for the ETA 6497.

JULY 28-30

CW21 Exam
Lititz Watch Technicum
Lititz, Pennsylvania

AUGUST 11-13

CW21 Exam
North Seattle Community College
Seattle, Washington

NOVEMBER 10-12

CW21 Exam
OSU
Okmulgee, Oklahoma

For additional details about specific courses in comprehensive syllabi form, including complete tool lists, visit: <http://www.awci.com/education-certification/education2/list-of-continuing-education-courses/> or contact Cindy Whitehead at 866-FOR-AWCI (367-2924), ext. 303.



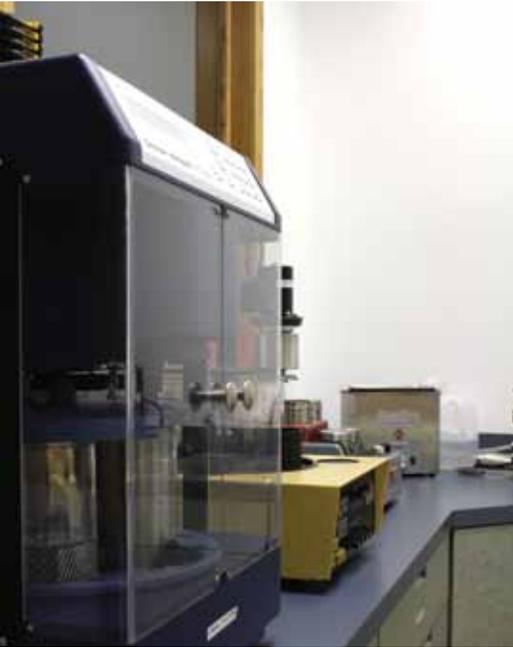
Want to work at a state-of-the-art facility?

Do you have the skills and drive to teach our AWCI students?

Then the instructor position may be of interest to you!

Apply now by logging on to our website at www.awci.com.

Click on *Career Center* to apply online.





Job Title: **Watchmaking Instructor**

About Us:

The American Watchmakers-Clockmakers Institute is a professional organization for watchmakers and clockmakers in the United States and across the world. We provide continuing education for professionals involved in after-sales service of watches and clocks. We house one of the largest collections of horological books and technical guides in the United States and are home to the Orville R. Hagans History of Time Museum. We produce a monthly magazine, *Horological Times*, and provide a wealth of benefits to our members. Our training facility is well equipped with all of the latest technology and infrastructure for teaching, including: bench camera, overhead projectors, large-screen televisions, wireless audio, and more. Thanks to generous support from partners in the watch and clock industry, our classroom also has all of the latest equipment necessary for teaching watchmaking and clockmaking, including the latest cleaning machines, timing equipment, water-testing equipment, casing equipment, and polishing equipment. We also have traditional watchmaking machinery including Horia 8mm watchmaker lathes, WW lathes, 102mm lathes, milling machines, drill presses, etc.

For more information visit our website at www.awci.com

Basic Responsibility:

Responsible for carrying out the educational mission of AWCI in concert with the Executive Director by providing technical training sessions that develop the necessary skills required to enhance the attendees' ability to deliver quality workmanship and high performance by demonstrating high professional standards.

Essential Functions:

Responsible primarily for the technical training of AWCI members with the aim of measurably increasing their skills and knowledge.

1. Designs and teaches courses that support the educational technical needs of the AWCI members.
2. Works with the BOE and the Education Committee to keep educational programs current and up to date with industry standards.
3. Facilitates the development of standardized curriculum for REC schools.
4. Prepares presentation material in electronic format to be used for in-house training and to be used on the Institute's website as needed.
5. Uses a facilitative style to motivate and encourage attendees. Models professional ethics and behavior appropriate for this role. Fosters a learning environment that assures the highest level of professional training.
6. Works with the Executive Director and Education Coordinator in planning and developing schedules for training. Prepares lesson plans based on the specific training request and guidelines provided by the Institute and the Industry (if pertaining to specific movements).
7. Takes a keen interest and looks for areas of improvement in the field of technical education and professional development. Shares observations and ideas with Executive Director.
8. Responsible for maintaining an immaculate training facility including equipment, training tools, aids, reference material, and audio visual. Creates technical information for training and education as needed.
9. Responsible for the inventory of tools, materials, and equipment in the training room. Assures the supply and proper training in the use and handling of all of tools and equipment.
10. Maintains necessary record of the training conducted and progress reports on all trainees.
11. Assures compliance with all pertinent safety requirements and instructs trainees accordingly.

Minimum Requirements:

Education: High School, preferably college graduate. Formal watchmaking education, CW21, or other industry-recognized certification. Must have participated in formal watchmaking program and/or continuing education programs.

Experience: Minimum of 5 years experience working with high-quality watches, familiarity with similar educational environments and processes.

Other: Strong technical knowledge and ability to share it with all levels of the organization, strong written and verbal communication skills, ability to interact with technical and non-technical staff members, strong computer skills and knowledge. Willing/able to travel for offsite courses, etc.

Skill Requirements:

1. Able to transfer knowledge in a compelling way and to command attention of a group.
2. Be the source for technical knowledge about watches.
3. Knowledge of high-grade watch service.
4. Must be well versed in pertinent repair techniques including escapement and hairspring adjustment, precision timing, etc., and making/altering small parts.
5. Strong knowledge of basic business software like Microsoft Word, Excel, Outlook, as well as industry tools like CAD.
6. Good oral and written communication skills in technical subjects and familiarity with researching and applying technical literature to the work process.
7. Must be familiar with all pertinent tools and equipment.
8. Must be knowledgeable of proper safety procedures in the work place.

Reports Directly To: Executive Director AWCI

Certification Update

By Wesley Grau, CMW21

In 2012 discussion regarding the current state of the Certified Watchmakers exam began. From these discussions, a task force of certified members and industry representatives was formed to evaluate the program. Out of this task force came recommendations for improvements to the examination. Some of the objectives were to remove the redundancies while moving toward a more dynamic approach and to increase the consistency in the assessment process. During 2013 new exam procedures and components were developed and piloted and are now ready to be administered. The following explains how the examination will be administered in the coming year.

The examination consists of four components, and will be administered over the course of three eight-hour days. After a brief orientation, the first component, a written examination consisting of 21 questions will be administered. The questions are short-answer or label-type questions that cover 10 horological topics: basic nomenclature, calculations, diagnosing, lubrication, escapements, automatic systems, chronograph systems, quartz, timing, and hairspring adjustments. This component takes place during the morning of the first day and ends with a lunch break. After lunch the examinees choose the rest of the components (practical in nature). These components have been prepared with identification numbers and are presented to each examinee, who randomly chooses a number which is recorded under his or her assigned examination number. This system allows for complete anonymity and assures that examinees' work will not be able to be identified.

The first practical component we will explain is the quartz component. This component consists of a complete

service of a quartz watch. The examinee must have a comprehension of all pertinent electronic diagnostic tests, and proper service of a modern quartz movement. In addition, the examinee may be called on to perform a proper stem replacement as well as water-resistance diagnosis and intervention on the case.

The second practical component we will explain is the micromechanical component. For this component the base movement of an ETA 2824 (movement only with no case) is used. The examinee is requested to run timing results and then replace the balance staff and fabricate a new barrel bridge bushing, service the movement, and run final timing results. The examinee must be proficient with a current method of balance staff replacement as well as proficient with the lathe for this exam component.

The third and final practical component is the complete service of a watch with an ETA 7750 movement. For this examination component, the examinee is requested to service the movement and make appropriate adjustments to the escapement and chronograph mechanism. The examinee must be proficient with adjusting watch escapements as well as the multiple adjustment of a chronograph mechanism.

With all of these exam components, the examinee must pay great attention to proper cleaning, lubrication techniques, as well as aesthetic preservation of the components. It is highly recommended that candidates preparing for this examination seek the counsel of certified members and have their practice work evaluated by them if possible.



Time is money.

Knowing how to properly repair watches and clocks saves time - while also generating additional traffic and profits. It also helps to protect and enhance the brands you promote as well as your reputation and integrity. Expertise through formal training is available through AWC, 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.



American Watchmakers Clockmakers Institute 701 Enterprise Drive Harrison, OH 45030-1696 866.367.2924

Making a Button Cover for an 18 Size Pocket Watch

By Wesley Simmons

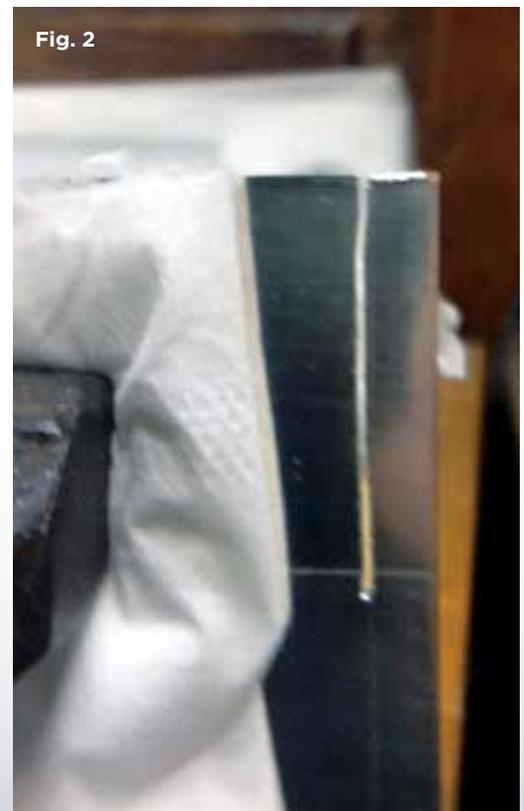
An unsightly pocket-watch case needing many repairs came to the bench of Wesley Simmons, a watchmaker at Illinois Watch Company. His biggest task was to create a silver cover for the button that opens the case.

A few weeks ago a customer brought in an 18 size Waltham pocket watch with a silver hunting case to be repaired. The watch was rough and needed many repairs, including putting a silver cover on the button that opens the front hunting case cover. The button had worn down to its brass core from many years of use. The brass showing on the silver case made it quite the eyesore, as seen in Figure 1.



First, I needed to create a plan of action for how to fix this problem. I decided to purchase a silver plate and cut out a long strip that would wrap around the existing brass core; I would also make a disc to be laser welded on the top of this silver cylinder. Lastly, I would add a buffed finish to match the case.

Once the 1mm-thick silver plate was in the bench vice, it was time to cut out the strip that would form a cylinder around the brass core. To begin, I measured the brass core's diameter and height. I had to find the silver's functional height as this button presses down to activate the front cover, so I had to leave some room toward the bottom to allow this action. I did this by pressing the button down until it stopped and then measuring what still stuck out. As seen in Figure 2, this was done by putting the plate in a bench vice and cutting the piece out with a jeweler's saw. Once the piece was fully cut from the plate, I smoothed the edges down on a power hone.



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Offer Expires February 28, 2014

Shop drawings with critical
drawing notes...

82 fully illustrated pages.

orig price ~~\$21.95~~

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Best of J.E. Coleman: Clockmaker

This popular reference book is
available from AWCI at the
incredible low price of...

orig price ~~\$51.95~~

\$27.48

plus shipping and handling

A collection of Gruen Watches...

orig price ~~\$8.95~~

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plus shipping and handling

This book is a comprehensive treatise
on ships' chronometers. There are 499
pages of scholarly research, profusely
illustrated with photos, charts and
original, easy-to-understand drawings.
A must for the practical watchmaker
and for every serious student of these
remarkable timepieces.

orig price ~~\$79.99~~

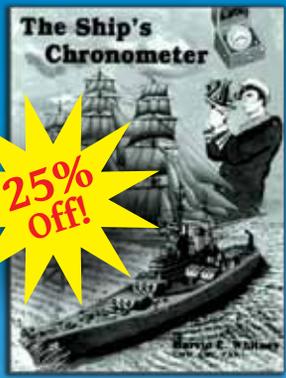
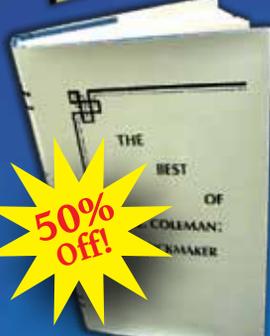
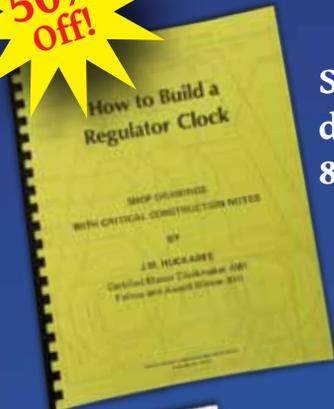
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25%
Off!

The Evolution of the Gruen Watch Company

By Kathy Ortt



Dietrich Gruen (1847-1911)

Dietrich Gruen's aim was to make his watches smaller, thinner, and more comfortable to carry in a vest pocket.

a U.S. patent for an improved safety pinion. He had started the Columbus Watch Company in Columbus, Ohio. For a time, movements were made for Dietrich Gruen in a suburb of Biel, Switzerland. The movements were then finished in Columbus. In 1882 Dietrich built a factory in Columbus so the movements could be made in America. Dietrich pioneered the 16 size movement. His interests were in reducing the size and thickness of movements prevalent at the time. Dietrich Gruen lost his company in the Panic of 1893; his business could not survive the recession that followed.

In 1894 Dietrich Gruen began again with his eldest son, Frederick, who was born in 1872, with their new company, D. Gruen & Son. Frederick had studied at Ohio State University and graduated from the Horological Institute in Glasshütte, Germany. Dietrich and Frederick designed a new series of movements in the 16 and 18 size with the help of the Assman firm in Glasshütte. The movements were made in 18- and 21-jewel quality, in both open-face and hunting-case arrangements. The escapement was designed by a man named Moritz Grossman. These D. Gruen & Son watches were considered as fine as any watch being made at the time.

In 1898, George Gruen, the second son, also joined the firm and the name was changed to D. Gruen & Sons. The product line remained the same and a subsidiary company, D. Gruen & Sohne, was formed in Glasshütte to handle the manufacturing of the products. Around the turn of the century, D. Gruen & Sons purchased the Queen City Watch Case Company of Cincinnati; the name was changed to Gruen National Watch Case Company. Shortly after this expansion, D. Gruen & Sons moved from Columbus to Cincinnati. The new company made their gold cases from then on.

Though Dietrich Gruen was the man responsible for germinating the seeds of the ideas behind the Gruen watches in our museum today, The Gruen Watch Company didn't actually operate under that name until 1922, 11 years after Dietrich Gruen's sudden death at sea. The first company started by Dietrich Gruen was the Columbus Watch Company in 1874.

Dietrich Gruen was a native of Osthofen, Germany, and was born in 1847. Dietrich began his watchmaking career as an apprentice to a noted horologist named Martens in Freiberg, Germany. After his apprenticeship, Dietrich Gruen worked for three years in Switzerland before joining his older brothers in America. Once in America, Dietrich migrated to Delaware, Ohio, where a friend of his father's lived. Dietrich eventually married the family's daughter, Pauline Wittlinger, and worked in his father-in-law's jewelry store.

On December 22, 1874, at age 27, Dietrich Gruen received

Rusty Barrel Arbor Repair

Part 2

By Dale LaDue, CMW21

In the first part of this article I described a method to restore a rusty barrel arbor by turning the rust away (while in the lathe) and creating a sleeve that would friction fit the turned-down shoulder.

I held the headstock with the barrel in it up to the headstock with the completed sleeve and marked the comparative height of the shoulder on the sleeve as shown in Figure 13. I faced the end flat. A toothpick tip was then inserted in the end of the sleeve, and a handheld graver tip was applied at the reference line, Figure 14. As the graver cut through the sleeve wall, the toothpick controlled the tiny cylinder as shown in Figure 15. This little piece could have been easily lost, which is one reason why I drilled the sleeve, as I mentioned in Part 1, deep enough to include another one. The toothpick captured the sleeve completely as shown in Figure 16. In order to give my client and my readers a comparison as to the actual size of this sleeve, I photographed it spanning just two epidermal ridges, resting on the tip of my finger, Figure 17.

I carefully placed the sleeve over the arbor's shoulder and pressed it in place with finger pressure as shown in Figure 18. The headstock was then remounted on the lathe and a small amount of "red" permanent stud and bearing locker was applied, Figure 19. I then used a flat-faced hole stake, from a staking tool set, that fit over the lower arbor pivot, and as the arbor slowly turned I cautiously tapped the sleeve fully in place as shown in Figure 20. As previously stated, if the sleeve



Fig. 14



Fig. 15

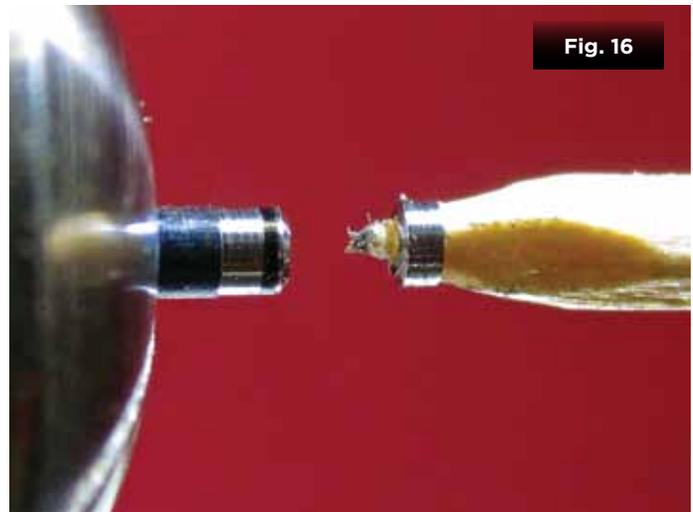


Fig. 16

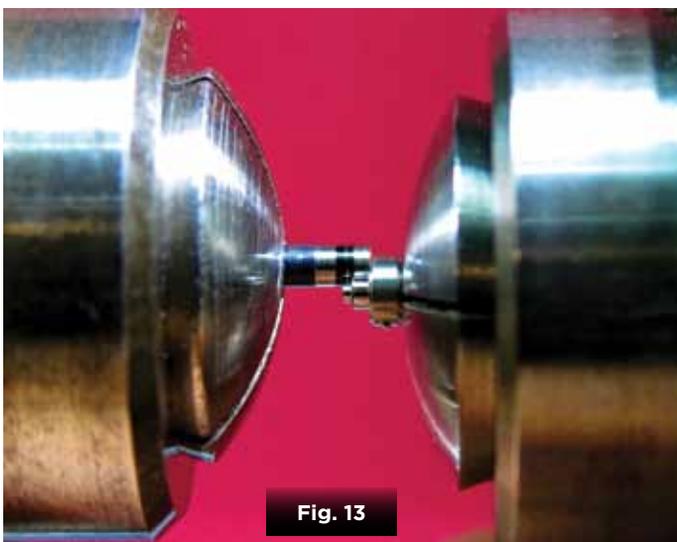


Fig. 13

Clockmaking – The Tools

Using the Lathe's Back Gear as a Spring Winder

By Laurie Penman

Mainspring extraction is a problem that is satisfactorily solved by most of the commercial spring winders as long as safety measures are observed:

- Keep to one side of the possible path of a spring breaking free of the anchor studs or jaws.
- Wear thick glove when possible.
- Wear a face mask.

However, as far as I know there is no commercial spring winder available for the enormous springs that drive Polyphon-type musical boxes; these can have “strengths” or thickness of 1mm (0.040”) or more, widths of around 80mm (3”), and wound diameters of around 100mm (4”)—they are very strong. I have only had to deal with a couple, and one of those had bent the next arbor in the train when the spring broke. The arbor was 14mm in diameter and probably a low-carbon steel; I replaced it with drill rod (silver steel).

The point of this anecdote is that the spring had to be extracted from the barrel (which needed repair)

and, of course, had to be installed when the barrel ring had been cut and replaced and the cause of the breakage removed. The tool involved was my Myford lathe, which had a “back gear,” Figure 1. This is a normal feature of engineer’s lathes (center lathes) with belt drives to the mandrel; it provides three or four more speeds to a headstock with a three- or four-step pulley. “Stepped” pulleys are groups of different-sized pulleys mounted on the same shaft. Figure 2 shows the arrangement of stepped pulleys and the back gear on a Southbend 10”, which is a very nice machine.

A back gear not only allows a very low gearing from the drive to the chuck (1700 to 50 on the American version with a 1700 rpm motor) but also allows the machinist to free the chuck from the drive so that it can be rotated manually and very easily. It can also be used to lock the mandrel and chuck rigidly.

Operation of Back Gear

There are four gears involved in the back gearing, and they can be seen plainly in Figure 2, starting with the small one at the front.

Gear A is directly connected to the stepped pulley.

Gears B and C are mounted directly on a common shaft (the counter shaft) and can be moved using the handle at top left to mesh or unmesh with gears A and D.

Gear D is connected directly to the chuck and *not* directly to the pulley.

Gear D can be connected to the pulley by means of a sliding bolt in a slot on D. When loosened and slid towards the center of the mandrel, it engages with a disk mounted on the pulley shaft, thus achieving a drive directly to the chuck.

When the gears B and C are disengaged by moving the lever, the chuck is entirely free and may be swung by hand. If the bolt is slid inwards and locked, the pulley and chuck revolve together, giving the top three speeds in the range.

When gears B and C are engaged with A and D by moving the lever, and with the bolt unlocked and moved outwards, the drive is from Pulley to A, A to B and C, C to D and chuck, which produces the lowest rpm in the range of chuck speeds.



Clock Case Refinishing and Cleaning Techniques

By Robert Little, CC, CW

Clockmaker Bob Little shares his secrets for cleaning, refinishing, and touching up wooden clock cases.

This article is about some of the techniques and products I have used over the years when cleaning, touching up, and refinishing clock cases. I have tried and used many different types of finishes on many wood projects, but what I will discuss is what I have come to like the best with the most common problems encountered. The two different types of finishes I use are lacquer- and oil-based rub-on products.

Lacquer-Based Finishes

Lacquer-based finishes set up by the solvent evaporating. The product I use is Deft's Clear Wood Finish Semi-Gloss Brushing Lacquer, Figure 1. It applies easy, by brush or by spray, and it sets up usually within 30 minutes. It can then be scuff sanded and recoated. Even when applied by brush, it levels beautifully with almost no brush lines or marks. While I use it almost exclusively on new work, such as newly built clock cases, book



cases, and cabinets, I do use it to touch up scratches on modern clock cases. I use one of the art brushes in Figure 2, to fill just the scratch and build up two or three coats and allow several hours for it to set up between applications. I then wet sand any buildup standing above the surface with 600-grit and then 1200-grit wet or dry sandpaper glued to a



craft stick. On small scratches, I might only use a tiny piece of the sandpaper, 1/4" x 1/4", to prevent over-sanding. The finish is then buffed with 3M buffing compound. I have projects I built in high school woodshop that are a little over 40 years old, and the finish looks as good as the day I put it on. The downside to using lacquer-type finishes is that if they are accidentally exposed to a solvent, it will almost immediately mar the finish. However, it can be repaired easily. I do not use this product over an entire existing finish since the solvents in the lacquer can lift and ruin an old finish. I use it primarily for scratch repair and on new wood projects.

Oil-Based Finishes

Oil-based finishes set up by curing, or polymerization. They take longer to set up and usually have a 24-hour waiting period before you can recoat. Wipe-on finishes are easiest to use because they can be applied with a special lint-free shop cloth or used panty hose. An old gunsmith introduced me to using old panty hose years ago because they are lint free, have a good finish-leveling ability, and can be used to wipe off excess finish and buff the coat before curing. They out-perform by far any other type of shop towel or rag I have ever tried. The oil finishes I use most are the Formby's

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