

November 2019



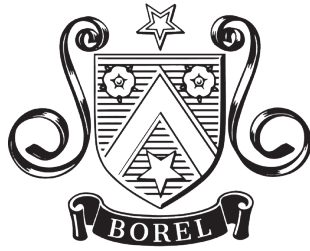
# *Vintage Column Wheel Chronographs, Part 2*

*CAD, CAM, and 3-D Printing, Part 5:  
The Many Layers of 3-D Printing*

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



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A Seth Thomas empire-style shelf clock at The Daughters of the American Revolution Museum, Washington, DC. Gift of Hilda Dobrzanski. See page 11.

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## OUR VISION:

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

## OUR MISSION:

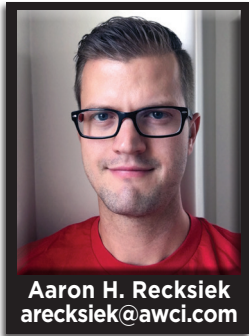
Setting service standards and educating the horological community.





a message from the  
**president**

AARON H. RECKSIEK, CW21



“We can do whatever we want!” This is something my kids have said to me several times over the years, but it’s also a thought that occurred to me during the annual Board of Directors meetings in early October.

The meetings started with a very positive report from Johnson Investment Council, our financial advisory firm, about the status of our perpetuation fund. The fund is continuing to grow year after year, even despite drawing a substantial amount from the fund to supplement our daily operations at the institute. A slowdown in the market is inevitable, so we are positioning ourselves to rely on the fund less and less and still be able to provide great benefits to our members and employ the best people in our industry.

So, back to my original statement. This does not mean that we can or should draw more money from the perpetuation fund than necessary to meet our basic operating expenses. During my tenure on the Board of Directors, several projects have been proposed that would have required a significant infusion of cash from the fund. Luckily, after careful consideration, we avoided removing any of the core capital to fund any projects. For example, the mobile classroom is fully self-funded, and we plan to keep it that way.

I look forward to serving as your president for the next year.

Also, this statement does not mean that we can disregard the will of our membership and do whatever we want with the institute. You have elected us to represent you on the board, and good board members will consider what the members who elected them to the board would want for the future of our organization.

Now, let me decipher what I actually mean by this statement. It means that we are in a fantastic financial position and are as independent from outside influences as we have ever been. You will read on page 9 about some of the changes we have made to

continued on page 38

a message from the  
**executive director**

JORDAN P. FICKLIN, CW21



In early October the Board of Directors held a productive annual meeting at our headquarters in Harrison, Ohio. Your board has made some exciting decisions that will help AWCI remain the premier institution for horological education.

Each year I prepare a state-of-the-institute report for the Board of Directors. The institute is doing very well. The numbers in this report reflect activities during the 2018-19 fiscal year, which ended June 30.

**Finances:** This past year we did better than we budgeted. Our operations are always supplemented by the Dodson Perpetuation Fund, but this year we didn’t need to rely on it as much as we thought we would. Despite taking on significant debt to build the Archie Perkins Mobile Horology Classroom, the institute posted a profit of more than \$450,000, in large part because of the excellent performance of the fund. In September, we made our final mortgage payment.

**Education:** Class attendance was up this year: 152 students attended classes with AWCI, not including the 136 individuals who participated in our Build a Watch events. The mobile classroom is in high demand and fulfilling its mission.

**Projects:** We made some major technology changes, some of which you probably have noticed. The Member Center section of our website is now driven by MemberClicks software, which will allow us to provide quality services to each of you. If you haven’t done so yet, you will need to create a new password to access some of our web services, such as technical documents and *Horological Times* archives. That same password will be used to log in and renew your membership or update your directory listing.

Speaking of renewing your membership, it is that time of year. About the same time you receive this magazine, you will receive an email inviting you to renew your membership. One thing you may notice

AWCI has lowered your dues for the first time in AWCI history.

continued on page 38



## HT Reader Survey

Thanks to everyone who took the time to fill out the *Horological Times* reader survey that was sent to members via email in September. We received a good response with many write-in comments. Your

feedback will help us plan as we transition into 2020. Our goals for conducting the survey were to gauge members' valuations of AWCI benefits; to see if members had downloaded the digital app and used the code; and to learn members' likes and dislikes regarding HT's content.

We found that HT is the most valued benefit. The next most valued benefits were access to technical guides, classes, networking, and the library. Trailing

these benefits were the Find a Professional directory, affiliate chapters, convention, merchandise, and shipping discounts.

Members ranked the most valuable content in HT as follows: columns, technical discussions, features, industry news, AWCI news, education and certification, business, classified ads, and book reviews.

We also learned that not many members had downloaded the digital app for reading HT on a mobile device, nor had they applied the code that was mailed to them for reading HT on the app. Please see Jordan Ficklin's message on page 9 for more information about this.

Thanks again for your participation. If you want to share ideas, opinions, or have questions, please contact the editor at [editor@awci.com](mailto:editor@awci.com).

## Drawing for DIY Tool Maker, October HT

In October's HT, we neglected to include the drawing in the column DIY Tool Maker, Beat Error Adjusters, on page 38. Please see the drawing on the right.

SIZE	OD	HOLE Ø	DEPTH	HEIGHT	BASE
A	1.00	.25	2.50	.15	.20
B	1.20	.50	5.00	.25	.35
C	1.75	.70	6.00	.40	.45

(2) MAKE FROM TOOL STEEL TYPE O1  
 (1) MAKE FROM TOOL STEEL TYPE O1

DIMENSIONS IN MM **BEAT ERROR ADJUSTERS**

If you have read something in *Horological Times* that you would like to comment on, please contact the editors at [editor@awci.com](mailto:editor@awci.com). We welcome your comments, questions, and suggestions.



# AWCI educational calendar

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

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

November  
11-15

WATCH 100: **Introduction to Watchmaking**  
Instructor: Tom Schomaker, CMW21  
AWCI Headquarters, Harrison, Ohio

\$1,095

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

**2020 IS RIGHT AROUND THE CORNER!  
REGISTER NOW TO ENSURE YOUR SPOT!**

January  
6-10

Watch 250:  
**Essential Micromechanics—  
The Watchmaker's Lathe**  
Instructor: Jason Champion, CW21  
AWCI Headquarters, Harrison, Ohio

\$1,095

The purpose of this course is to teach the student basic micromechanics skills and all the basics of operating a watchmaker's lathe.

January  
6-10

Watch 350:  
**Tool Making for Watchmakers and  
Clockmakers—The Watchmaker's Lathe II**  
Instructor: Tom Schomaker, CMW21  
AWCI Headquarters, Harrison, Ohio

\$1,095

This course is a continuation to Watchmaker's Lathe I. The purpose is to teach the student the necessary knowledge and hand skills to manufacture various parts in steel that will be functional in a mechanical watch, e.g., the winding stem.

February  
10-14

WATCH 180:  
**Basic Watch Service**  
Instructor: Tom Schomaker, CMW21  
AWCI Headquarters, Harrison, Ohio

\$1,095

Come participate in this course to build upon the skills from Watch 100: Introduction to Watchmaking. Additional skills will be covered, bridging this class to other more advanced classes.

March  
9-13

WATCH 150:  
**Service on the Watch Case**  
Instructor: Tom Schomaker, CMW21  
AWCI Headquarters, Harrison, Ohio

\$1,095

Five watches in five days. Build upon the skills from Watch 100: Introduction to Watchmaking. Additional skills will be covered, bridging this class to other more advanced classes.

April  
6-10

WATCH 155:  
**Fundamentals on Quartz Watches**  
Instructor: Jason Champion, CW21  
AWCI Headquarters, Harrison, Ohio

\$1,095

Build upon the skills from Watch 100: Introduction to Watchmaking. Additional skills will be covered, bridging this class to other more advanced classes.

April  
6-10

WATCH 210:  
**Quartz and Quartz Chronograph Service  
Procedures and Diagnostics**  
Instructor: Tom Schomaker, CMW21  
AWCI Headquarters, Harrison, Ohio

\$1,095

Learn fundamentals of quartz watch repair and service on basic and chronograph quartz movements.

April  
20-24

WATCH 220:  
**Modern Mechanical Chronograph**  
Instructor: Tom Schomaker, CMW21  
AWCI Headquarters, Harrison, Ohio

\$1,095

Students will learn all the basics of the modern mechanical chronographs that are most prevalent in today's market as well as gain a profound understanding of how chronograph watches operate. Prerequisites: It is beneficial for the student to have a minimum of 3 years' experience in manual and/or automatic watch repair; own *The Theory of Horology* and read chapter 11.

April  
25-27

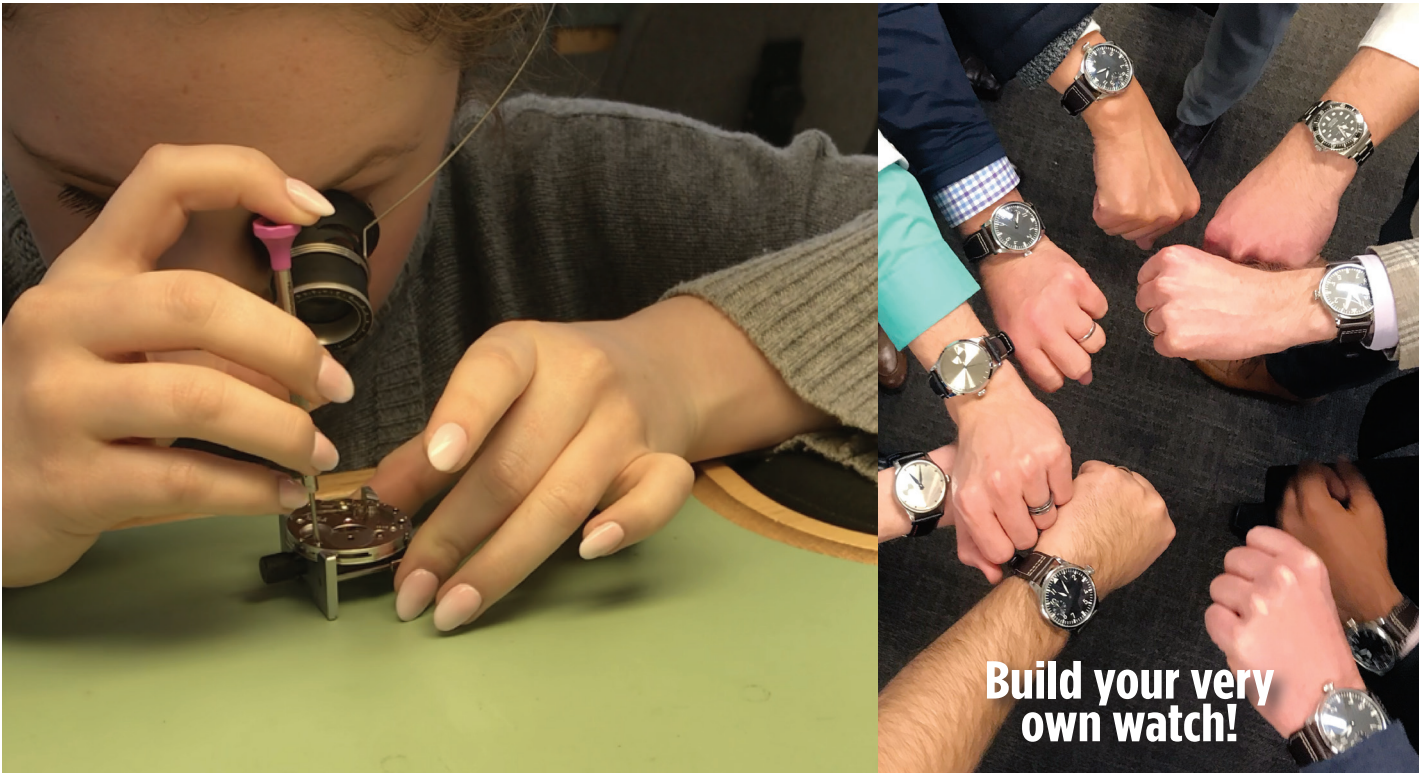
**CW21 Exam**  
AWCI Headquarters, Harrison, Ohio

Multiple components will be available for examination.



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





**Build your very own watch!**

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

**May  
4-8**

**Midwest Watchmakers & Clockmakers  
Association and Minnesota Clockmakers  
Guild**



**St Paul, MN**

**May  
8-9**

**Midwest Watchmakers & Clockmakers  
Association Annual Conference**



**St Paul, MN**

**YOU PICK  
THE DATE**

**Build a Watch**

**Your City!**



For more information go to: [www.awci.com/buildawatch](http://www.awci.com/buildawatch)

To find out how you can bring one of these events to your store,  
contact the education director, Jason Champion, CW21, at [education@awci.com](mailto:education@awci.com)



# CHANGES TO YOUR AWCI MEMBERSHIP

By Jordan P. Ficklin, CW21

Each year we revisit the price of membership in AWCI. We never want to raise dues and for several years in a row we haven't needed to. This year is no exception. In fact, for many of you the price of dues will go down, while the prices for everything else are going up. We've lowered the annual cost of membership to just \$150 for regular members. Senior members between ages 70 and 79 will pay just \$138.50, and those 80 years and older will pay just \$125. Students at REC schools continue to get one year of membership for free and pay just \$75 for their second year.

**What's the catch?** How can we possibly lower the price of dues? To appeal to the needs of future generations of horologists and to reduce our environmental footprint, our membership now includes a digital subscription to *Horological Times*.

**Don't worry!** You can still get a printed copy of *Horological Times* in the mail. US-based members can receive *Horological Times* in the mail for just \$25 more (that's the same price you have been paying), and international members will receive a printed copy for an extra \$55. Lifetime members receive all the benefits of regular members, including their digital subscription to *Horological Times*. Lifetime members can continue to receive the printed version for just \$25 or \$55 per year, which is significantly less than what it costs to print and mail this beautiful magazine.

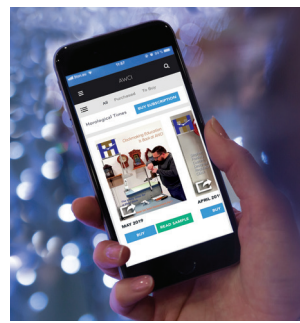
With an increased emphasis on our digital publication, we recognize that our first attempt at a *Horological Times* app wasn't our best effort. We have decided to find a new partner and release a better-quality digital version of our magazine. Stay tuned

for more information. Our printed publication will also undergo a minor change as we switch to a matte paper instead of glossy, which will make it easier to read in bright environments.

Of course, your membership still includes a listing in our Find a Professional directory along with many other valuable resources. Our Find a Professional directory receives more than 12,000 views every year. That is about 10 views for every member. If you are in our directory, be sure you are

getting noticed by updating your listing. Additionally, we provide an average of three referrals per day over the telephone. Despite all of this, we are looking for ways to improve our Find a Professional directory and to bring added benefits to our certified members. A committee has been formed to help implement the AWCI Certified program that was approved by the board two years ago. You will notice some changes immediately, including the display of the AWCI Certified logo next to the name of all certified members, including CC21, CMC21, CW21, CMW21, CC, CMC, CW, CMW, CMEW, and CEWT.

	Current Dues	New Dues	+ HT (US)	+ HT (Int'l)
Regular Membership	<del>\$175</del>	<b>\$150</b>	\$175	\$205
Seniors (70-79 yrs)	<del>\$157.50</del>	<b>\$138.50</b>	\$163.50	\$193.50
Seniors (80+)	<del>\$140</del>	<b>\$125</b>	\$150	\$180
Student & Rec Schools 1st Year (includes printed copy of HT)	<b>Free!</b>	<b>Free!</b>	<b>Free!</b>	<b>Free!</b>
Student & Rec Schools 2nd Year	<del>\$87.50</del>	<b>\$75</b>	\$100	\$130



Jordan Ficklin is the executive director of AWCI.

# Harold J. and Marie Borneman Greenwood Memorial Fund Grant

## Awarded by the AWCI ELM Trust

The American Watchmakers-Clockmakers Institute's Education, Library, and Museum Trust (AWCI-ELM Trust) announces a new format for the Greenwood Memorial Fund Grant. Each year a total of \$5,000 in award money is available for students attending full-time watchmaking or clockmaking schools that participate in the AWCI Research and Education Council (REC).

Two grants of \$2,500 cash will be awarded in 2019 to students who demonstrate a passion for horology.

### How to Apply?

To apply for the grant please submit an application and essay describing your passion for horology, how the scholarship will benefit you, and how you plan on participating in the horological community.

Letters of recommendation are not required but they are preferred.

Applications can be submitted at [awci.com/scholarship](http://awci.com/scholarship) before December 15, 2019.

### Eligibility

Students enrolled in, or accepted at, AWCI REC Schools at the time of application are eligible to apply.

Grant recipients must be legal US residents and will be required to provide an IRS Form W-9.\*\*

### How are recipients chosen?

The selection committee consists of AWCI staff and past recipients of the award. The committee will select two recipients using the following (subjective and objective) criteria:

- Passion for Horology
- Financial Need
- Participation in the Horological Community
- Academic Achievement
- Recommendations

### When will the scholarship be awarded?

Recipients will be notified by January 15, 2020.



Last year's winners of the Greenwood Memorial Grant, Willet Ardis and Chris Bridges.

\*\*AWCI does not offer tax advice, legal, or accounting advice. Grant recipients should consult their own tax, legal, and accounting advisors to determine whether the grant will be considered taxable income by the IRS.

# Timeless Treasures: The Clocks of the DAR

By Deanna Lutz

When you hear mention of the National Society Daughters of the American Revolution, or DAR as it is more commonly known, patriots and family genealogy are probably the first things that come to mind. That is rightly so as the DAR is very much about patriots and genealogy. Membership in the DAR is contingent upon being able to prove a lineal, bloodline descent from an ancestor who aided in achieving American independence; and yet the DAR is so much more beyond the family tree!

Founded in 1890 with the goals of patriotism, education, and historic preservation, the DAR quickly set upon acquiring land in Washington, DC, on which to build their national headquarters and to house their annual national convention. Inside the white marble, and significantly fireproof, Beaux-Arts buildings are preserved and exhibited the relics, treasures, and papers of the DAR.

Raising funds to build the first building, Memorial Continental Hall, was a mammoth undertaking! Paid

for entirely by members and chapters of the DAR, the larger, more populous state societies funded entire rooms while smaller states funded items like windows, doors, and stairwells. Construction was completed in 1910, and the building was designated a National Historic Landmark in 1972.

The state-funded period rooms are important museum showcases, each being decorated to show the evolution of the American home between 1690 and 1940. While displaying a timeline of American clock-makers was not the objective, a visit to the museum provides a delightful opportunity to view a broad range of early clocks. Let's explore a few highlights of this wonderful collection.

We begin our tour in the 20th century. Visitors to the DAR Library, which is housed in the bright and airy original auditorium of Memorial Continental Hall, are watched over by this large clock made by J.E. Caldwell & Co. in 1910, an American jeweler in Philadelphia, Figure 1. Interestingly, it was Caldwell who was selected to represent the American Jewelry Maker at the first World's Fair in the United States. Held in Philadelphia, the Centennial International Exposition of 1876 celebrated the 100th anniversary of the signing of the Declaration of Independence.<sup>1</sup>

The oldest clock in the collection is a British lantern wall clock from around 1690. Mounted on an oak bracket with holes in the base to accommodate the ropes attached to the pulleys, the clock is one-handed to indicate hours only. Made during the reign of Dutch-born William III, the clock is topped with cast brass ornamentation representing the golden lion and silver unicorn supporters in the royal coat of arms of the United Kingdom. The face of the clock is decorated with stylized tulip blossoms, Figure 2.



**Editor's Note:** To view the clocks of Silas Hoadley and William Crawford, visit the DAR's website and do a search of the museum collection at <https://collections.dar.org/RediscoveryProficioPublicSearch/CollectionsHome.aspx?DARCOLL> by typing each name in the search bar.



1. Wikipedia, James Emmot Caldwell, [https://en.wikipedia.org/wiki/James\\_Emmot\\_Caldwell](https://en.wikipedia.org/wiki/James_Emmot_Caldwell), accessed August 8, 2019.

Connecticut clockmaker Eli Terry, who introduced mass production to the art of clockmaking, is represented by a very fine pillar and scroll mahogany shelf clock from about 1814, Figure 3. Mass production also meant affordability. Before this, few people could afford to own a clock. The clock still bears its original label inside reading, “Warranted if well used. N.B. The public may be assured that this kind of clock will run as long without repairs and be as durable and accurate for keeping time as any kind of clock whatsoever.” Originally belonging to Isaac Beals of Avon, Massachusetts, a prominent manufacturer,<sup>2</sup> and donated by sisters Florence Clapp Cunningham and Mary Ella Clapp Alline. The name Cunningham is written in pencil on the back of the face.



As you can imagine, there are several gorgeous tall case clocks in the museum, yet beauty can be seen in a case's simplicity. One of my favorite clocks in the collection has a plain pine case painted to look like mahogany by Silas Hoadley, one of the clockmakers from Plymouth, Connecticut. Instead of the cresting whales' tails typically found on the bonnet of Connecticut-made clocks, this example is flat-topped, which perfectly complements the modest lines of the waist and base. Hoadley started as a worker with Eli Terry, and later with Seth Thomas, until 1813 when he opened his own shop.<sup>3</sup>

If you've never had the pleasure of seeing a lighthouse clock in person, the one in the collection is certainly worth a visit! This type of clock was originally known as the “Patent Alarm Timepiece” and affectionally called a lighthouse clock by collectors for their obvious similarities. First patented in 1819 by Simon Willard, this clock was not a commercial success, and it is speculated that fewer than 200 were manufactured. Willard worked to improve both the clock movement and the case design. Because of this, there are many construction variants and no two lighthouse clocks are completely identical. The clock pictured in Figure 4 represents the third and final

model designed by Simon Willard. Though like earlier models, this version lacks an alarm mechanism and bell that would have been situated in place of the gilt finial above the face. Just steps from the DAR, there is another example in The White House collection which has a portrait of the Marquis de Lafayette, who was received there in 1824 and 1825 when he returned to the United States on a farewell visit.<sup>4</sup>

William Crawford (1745-1833) of Oakham, Massachusetts, was a Sergeant of Captain John Crawford's Company, Colonel James Converse's Regiment Massachusetts Militia during the Revolutionary War. He was also a Captain of the Washington Grenadiers for the War of 1812 and later a Brigadier General in the Massachusetts Militia. As a civilian, he was a statesman, county commissioner, town clerk, and selectman,<sup>5</sup> but more importantly for the subject of this article he was a fine clockmaker. His tall case clock has the distinction of being the only clock that can be attributed to a patriot clockmaker. It is a



2. Town of Avon, 1888-1963 *Diamond Jubilee 75th Anniversary Celebration*, p. 8. <http://www.stoughtonhistory.com/avon75th.pdf>  
 3. Palmer, Brooks, *A Treasury of American Clocks*. The Macmillan Company, New York, NY, p. 91.

4. DAR Museum. <https://collections.dar.org/RediscoveryProficioPublicSearch/ShowItem.aspx?31448>, accessed July 25, 2019.  
 5. Secretary of the Commonwealth. *Massachusetts Soldiers and Sailors of the Revolutionary War*. Vol. 4, p. 97. Boston, MA, USA: Wright & Potter Printing, 1896-1908.

beautiful example with its architectural details. The bonnet door is flanked by freestanding columns and a molded keystone above that extends through the molded arch that surrounds an engraved brass face. The waist is plain although the door has a Rococo-style scallop across the top edge and is displayed in the Massachusetts period room. There is another example, similar in style to this clock, that may be found at the Old Sturbridge Village.<sup>6</sup>

Seth Thomas clocks are represented through many examples in the museum. The empire style shelf clock in Figure 5 was originally the property of William

Brock (1818-1899), a prominent citizen of Greene County, Ohio.<sup>7</sup> The donor of this handsome eight-day clock related to the museum that her uncle found this clock in pieces in the loft of the barn on the family farm in Ohio. He put it back together, and it worked well for many years. Curiously, the bottom panel of glass has been placed upside down.

The banjo-style clock is beautifully represented by this early example manufactured by Horace Tifft of North Attleboro, Massachusetts, dating to the 1830s, Figure 6. True to the early banjo clocks, this one is a time-only movement. The mahogany case



Fig. 5



Fig. 6

6. Old Sturbridge Village Online Collection. <https://collections.osv.org/object-57-1-240>, accessed July 15, 2019.

7. Chapman Brothers. *Portrait and Biographical Album of Greene and Clark Counties, Ohio*. 1890, Chicago, IL, p. 333-334.

has wonderfully carved side scrolls. The bottom glass panel depicting a house is a modern replacement.

Turning back to tall case clocks, the engraved brass-faced clock with carved rosette scrolls and topped with an urn-shaped finial is the work of Benjamin Reeve, Figure 7. Reeve was a Greenwich, New Jersey, clockmaker who was active during the last quarter of the 18th century. The walnut case with bracket feet is attributed to Philadelphia workmanship. Excellent examples of Reeve's work can be found in collections in South Jersey.<sup>8</sup>

An astute student of American clockmakers may notice that a particular clock displayed in a state-sponsored period room may not actually have been

manufactured from that area. The period-room curator has taken care to place clocks that match the dates represented in each room. Such is the case with this clock made by Luman Watson in Cincinnati, Ohio, which now graces the Kentucky State room, Figure 8. It has a cherry case made by Elijah Warner of Lexington, Kentucky. The Watson firm was prolific. It is estimated that between 1815 and 1834, more than 30,000 tall case clocks were manufactured. However, the opening of the Erie Canal in 1825 brought greater ease of shipping to the Ohio Valley and a great number of cheaper Connecticut-made clocks, which, by the time of Watson's death, put an end to Ohio clockmaking.<sup>9</sup>



8. Van Hoesen, Walter Hamilton. *Craft and Craftsman of New Jersey*. Fairleigh Dickinson Univ. Press, 1973. p. 82.

9. Wikipedia, Luman Watson, [https://en.wikipedia.org/wiki/Luman\\_Watson](https://en.wikipedia.org/wiki/Luman_Watson), accessed July 28, 2019.

Let us close our tour of the DAR museum with an excellent example of New England-style fret work that sits atop a tall case clock made by Frederick Wingate of Augusta, Maine, Figure 9. Manufactured sometime around 1810-1815, this is truly a stunning clock with its bulbous finials, and inlaid panel of bird's-eye maple on the waist door, which is a recurring feature of clocks made in rural New England. The colorful painted dials, this one with lovely fan spandrels painted in gold, green, and red, is another recurring feature. Wingate often numbered his clocks, and examples as high as 302 have been found.<sup>10</sup> This clock is numbered 207 and was originally owned by Nathaniel Gilman, the son of a Revolutionary War patriot. It passed through the family until it was purchased by a Maine DAR member who gifted this stunning clock to the museum. We're so glad she did!

If you visit Washington, DC, I recommend a tour of the DAR museum. It is home to some of America's greatest decorative arts, and some wonderful old clocks!



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**Deanna Lutz** is currently Regent of the Harmony Hall Chapter NSDAR of Fort Washington, Maryland. She is also an independent clockmaker and owner of Southern Maryland Clock Repair.

<sup>10</sup> Delaney Antique Clocks. Frederick Wingate. <http://delaneyantiqueclocks.com/products/maker/196/>, accessed August 12, 2019.

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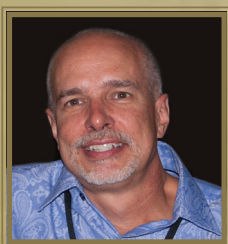
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# CAD, CAM, and 3-D Printing for the 21st-Century Watchmaker

## Part 5: The Many Layers of 3-D Printing

By Jason Ziegenbein, CW21

Just as a successful cake is dependent upon all its layers, the creation of a 3-D printed model is dependent upon each element in the process. Adding to the computer-aided design and computer-aided manufacturing is the 3-D printer and the material itself. Using a coil of plastic filament, the 3-D printer extrudes layer upon layer of plastic in a process called fused deposition modeling (FDM). The basic concept is simple, but as with all things, success or failure lies in the details.

While there are many different types of printers and media that fall underneath the additive-manufacturing umbrella, the gantry-style filament extruder is arguably the most common and easiest to start with. The Anycubic i3 Mega is an example of such a system, Figure 1. The main components of the system include:

- A. Filament
- B. Extruder
- C. Print Bed
- D. Framework
- E. Motion Control
- F. Controller

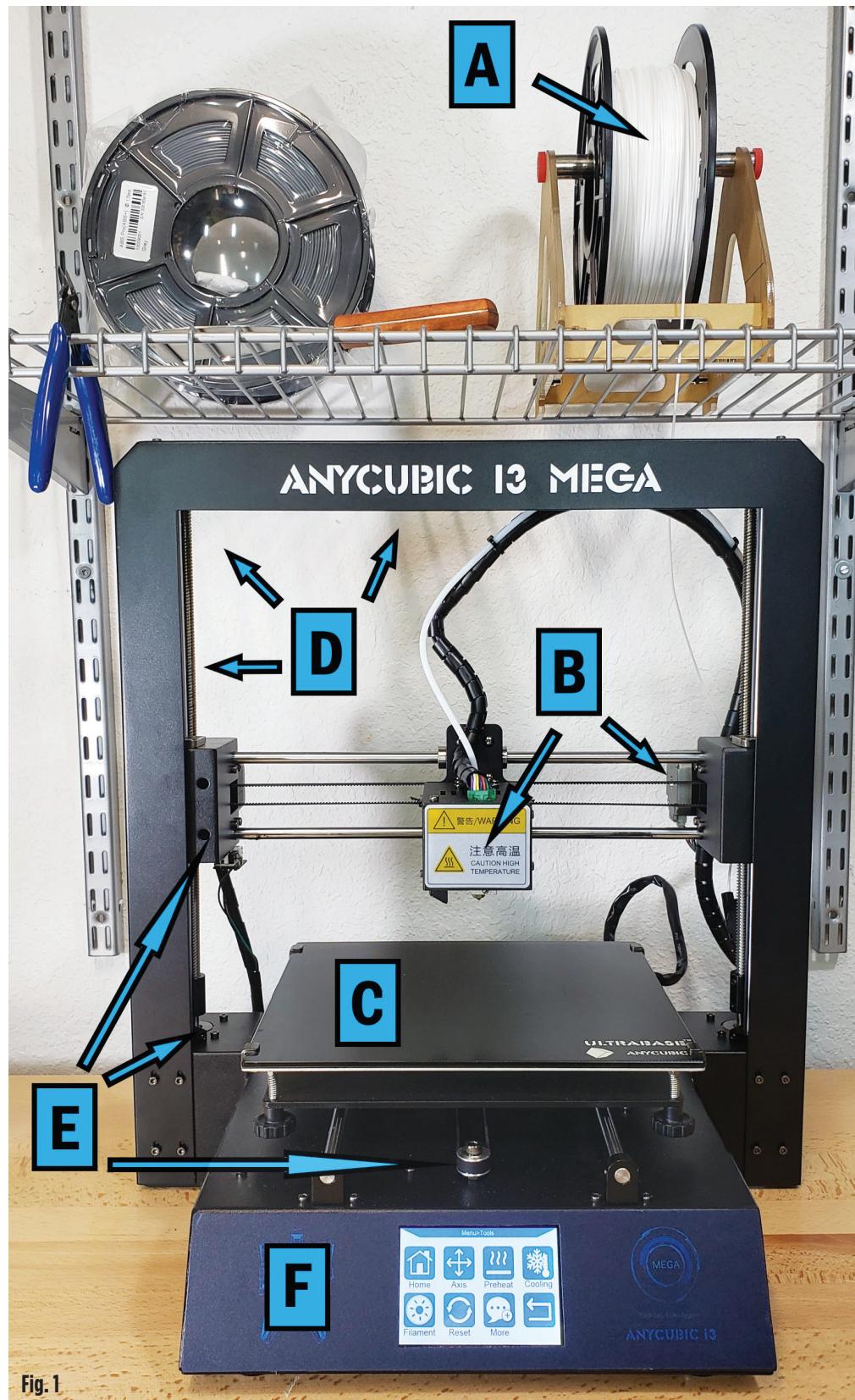


Fig. 1

The filament is fed into the extruder. This printer has a Bowden-style extruder, where the motor that feeds the filament to the hot end is not attached directly above the nozzle. Instead, the filament feeds into a flexible tube running between the feed motor and the hot end. Once it reaches the hot end, the filament is heated to a specific temperature and forced through a small-diameter nozzle, Figure 2.

In this case, the 1.75mm filament is extruded through a 0.40mm nozzle. The hot end mounts to a part of the gantry frame that travels in the X-axis across the print bed, and in the Z-axis toward and away from the print bed. The print bed travels forward and backward in the Y-axis, Figure 3.

The axis and the feed are driven by NEMA 17 stepper motors, whose motion is managed by a controller in the base. The G-code created with the slicing software feeds into the controller, which coordinates the motion of the machine to extrude the filament, layer upon layer until the print is complete.

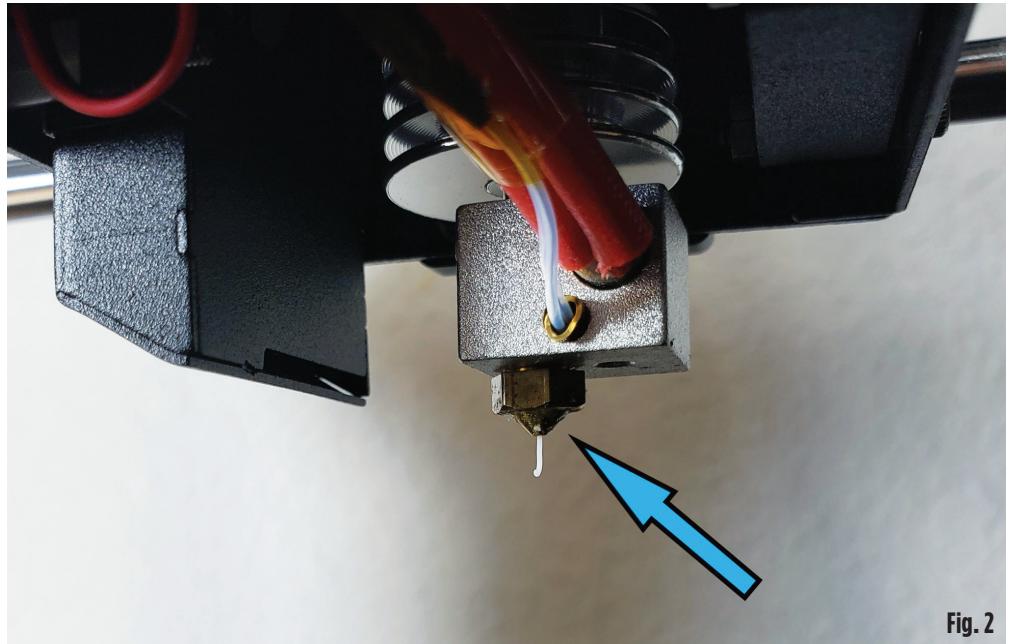


Fig. 2

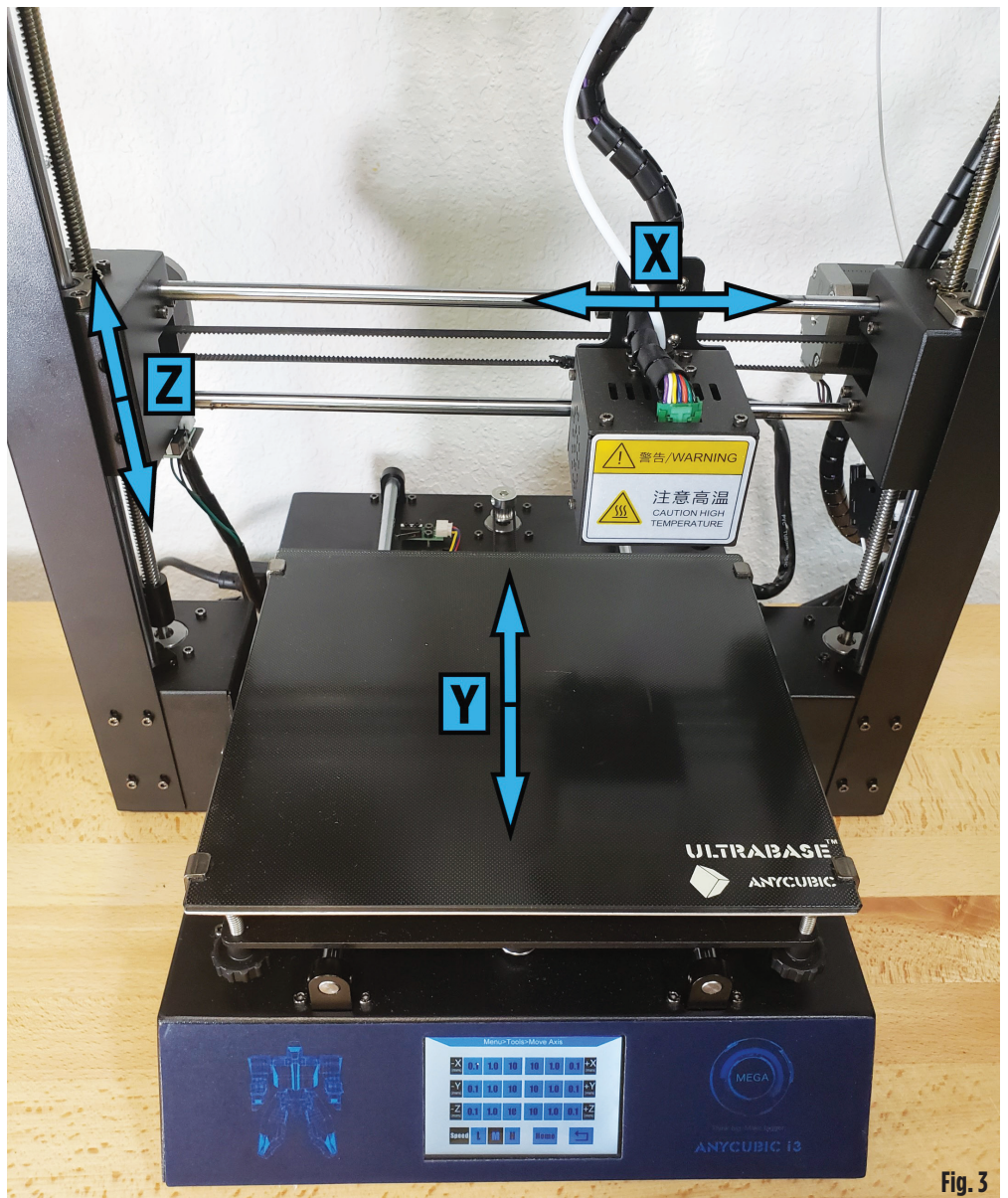


Fig. 3

The functional or aesthetic requirements of the print determine the choice of filament and the functionality of the printer. Looking at three common thermoplastics used in watchmaking identifies these features. Polylactic acid (PLA) is a popular choice for getting started with 3-D printing. PLA has a relatively low printing temperature of around 180°C -200°C, with minimal warp or shrink during the printing process. PLA prints have a relatively high strength with low flexibility. The low printing temperature means the prints do not withstand temperatures above 100°F very well. For example, leaving PLA prints in a car during summer can result in a puddle of plastic. At the same time, the relatively low print temperature and lack of shrinkage during cooling means this material does not require the print bed to be heated.

Even the least expensive FDM 3-D printers have little trouble printing polylactic acid, making it a good choice for beginning. Jigs, holders, and even dies for presses can be made from it, but it is neither as strong nor heat resistant as other materials.

Acrylonitrile butadiene styrene (ABS) is a plastic commonly used with injection molding—appliance housings, toys, and plastic movement rings are notable examples. ABS resists impact and wear better than PLA, with much better heat resistance. The printing temperature is higher, typically between 220°C -250°C. This temperature requires an all-metal hot end, such as the one in the i3 Mega, Figure 4.

Printing with ABS also releases fumes, so it's best done in a well-ventilated area.

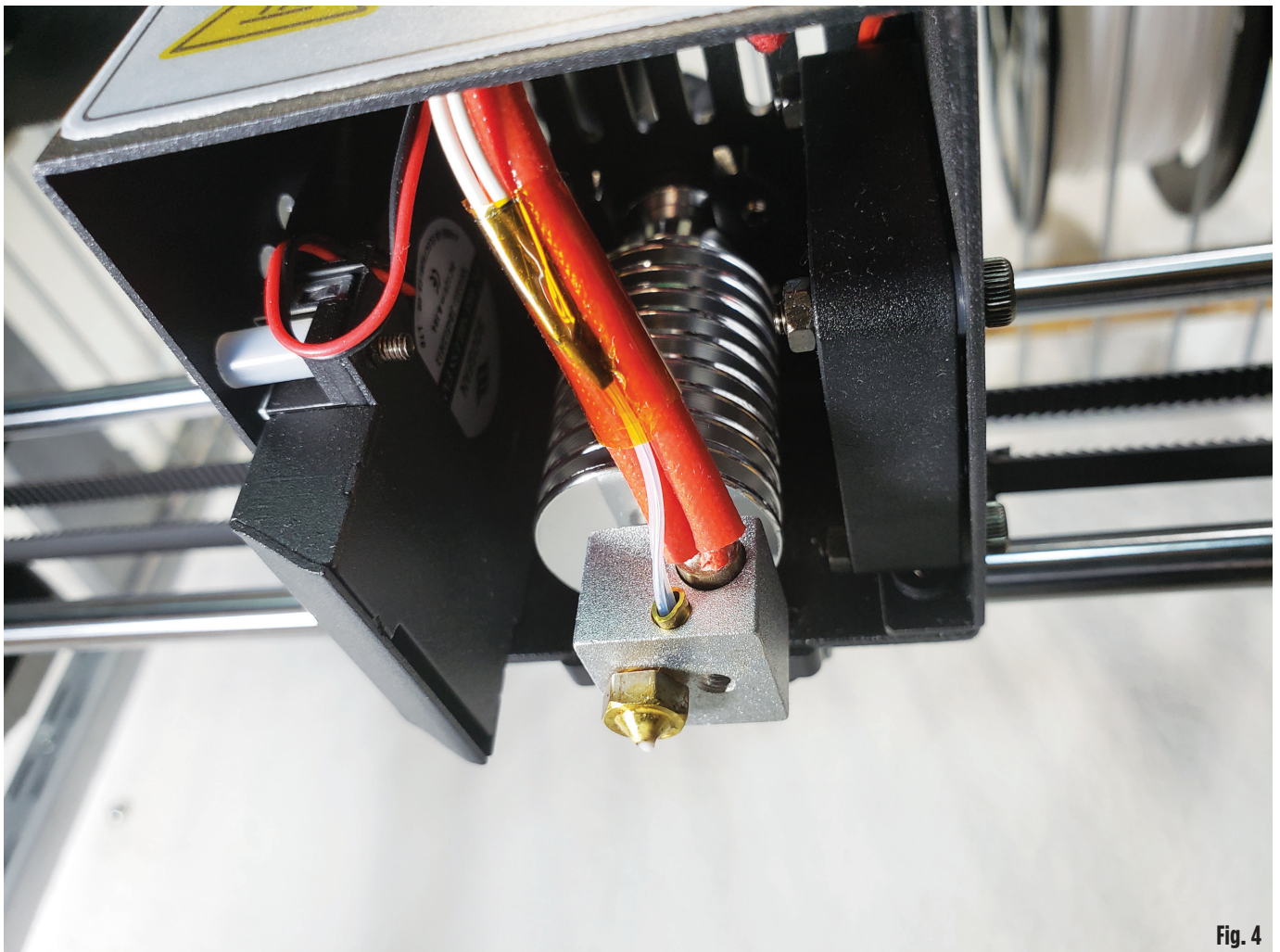


Fig. 4

Perhaps the largest drawback of ABS is that it shrinks, which requires additional considerations. One of these is a heated print bed. The heated bed promotes adhesion, preventing the material from peeling off as it shrinks during cooling. For especially large parts like a tool holder, an enclosed chamber may be required to keep in enough heat during printing, so the layers do not crack and delaminate. Another consideration is dimensionality. For the previously mentioned movement ring, it would have to be printed oversized and hand-fitted or be printed exactly enough oversized that it shrinks to dimension once cooled. While there are certainly challenges to overcome with ABS, the results are a far more usable and durable print.

Nylon offers even greater durability than ABS without adding much more complexity. Any printer capable of printing ABS will probably be able to print nylon. The setups are much the same, but nylon's printing temperature typically ranges 250°C or greater. The other significant challenge in printing with nylon is that it is hygroscopic—it absorbs water. Given 24 hours, nylon can absorb more than 10% of its weight in water. The moisture in the filament will explode as steam during printing causing a rough-textured print. For best results, nylon must either be kept dry and sealed when not in use or dried in an oven prior to use. Those results are worth it as thick prints are incredibly strong, and thin prints are flexible enough to work as hinges.

The print bed is a critical element to a successful 3-D print. Aside from heating, the surface material and flatness with respect to the extruder are critical as well. Some print beds are glass with a coating applied, Figure 5.

Some materials, such as nylon, may adhere best when the surface has been coated with a polyvinyl acetate (PVA) glue stick. Fortunately, the Internet is

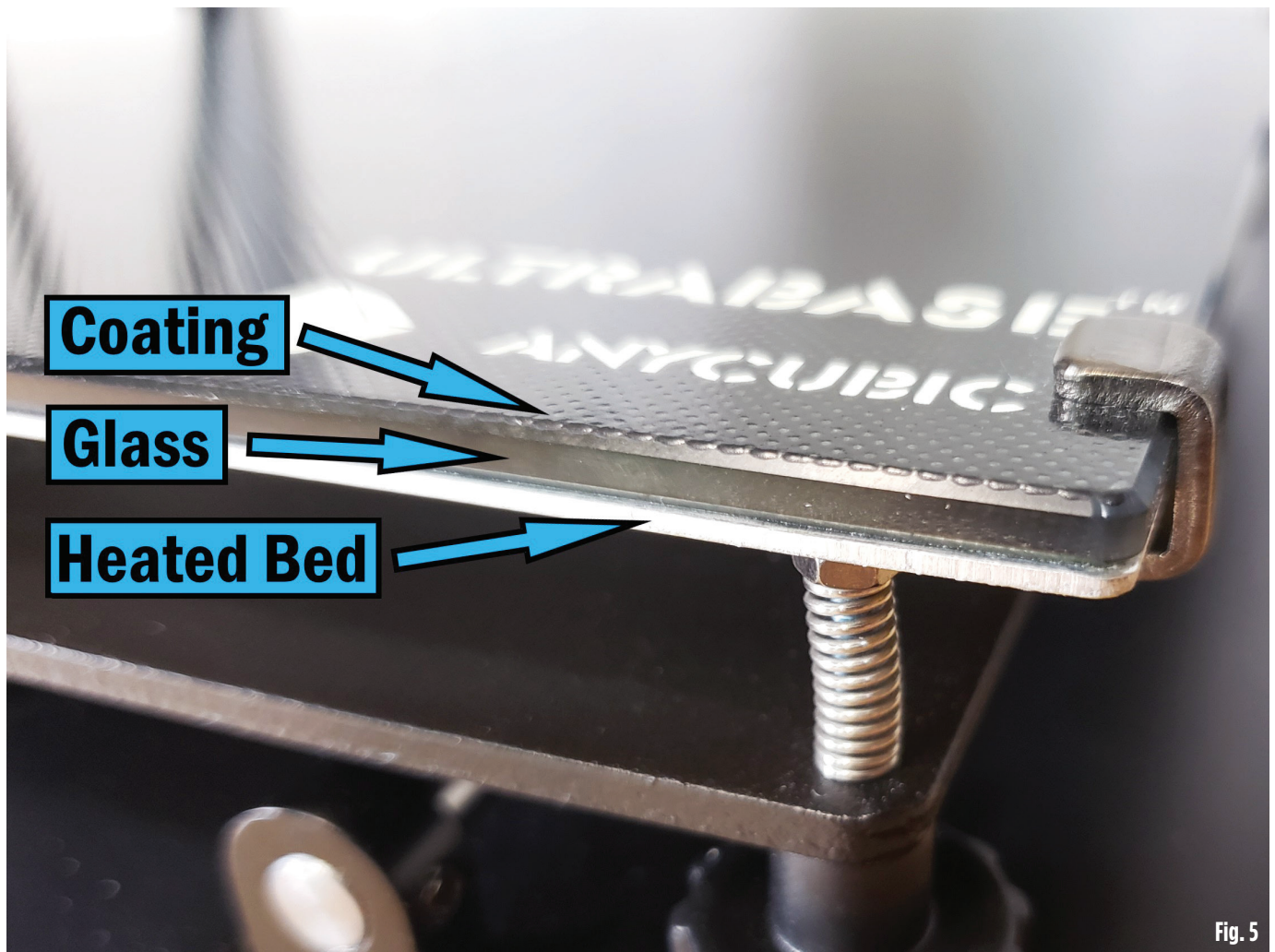


Fig. 5

full of experiences—good and bad—with practically every combination of printer and filament. Finding a few complementary suggestions is a good place to start. The first layer is also squeezed out a little closer to the surface than the typical layer height to promote the bond. When all variables are adjusted nicely, the 3-D print will adhere to the bed securely during printing and separate easily after.

The controller is the crucial link between the G-code and the mechanical construction of the printer. Most 3-D printers these days are either connected to a computer or will come with a built-in screen and hardware for adjusting parameters and selecting files. The controller drives the stepper motors moving the hot end, the bed, and the feed motor in the direction and speed specified in the code to create the print. The controller is in the base of this model, complemented by a touch screen on the front, Figure 6.

G-code files are selected from an SD card and thus printer and computer do not need to be located in the same place.

With the different possibilities of printers, filaments, adjustments, and settings, getting started with 3-D printing may seem a daunting task. Truthfully, it's not. The time from unboxing to printing the included demo file is often a matter of minutes. With the guidance of the manual, all it took was tightening a few screws, connecting a few connectors, and adjusting a couple of bed-leveling screws to get the i3 Mega up and running. This printer and a 1kg spool of PLA comes in right around \$200 at time of writing. Complicated and prohibitively expensive it was not. Considering the options, it provides for tooling, holders, and even a few select parts, this printer has been a positive and well-used addition to the tools at my disposal. From concept through completion, look for the last article of this series as all the pieces are put together.

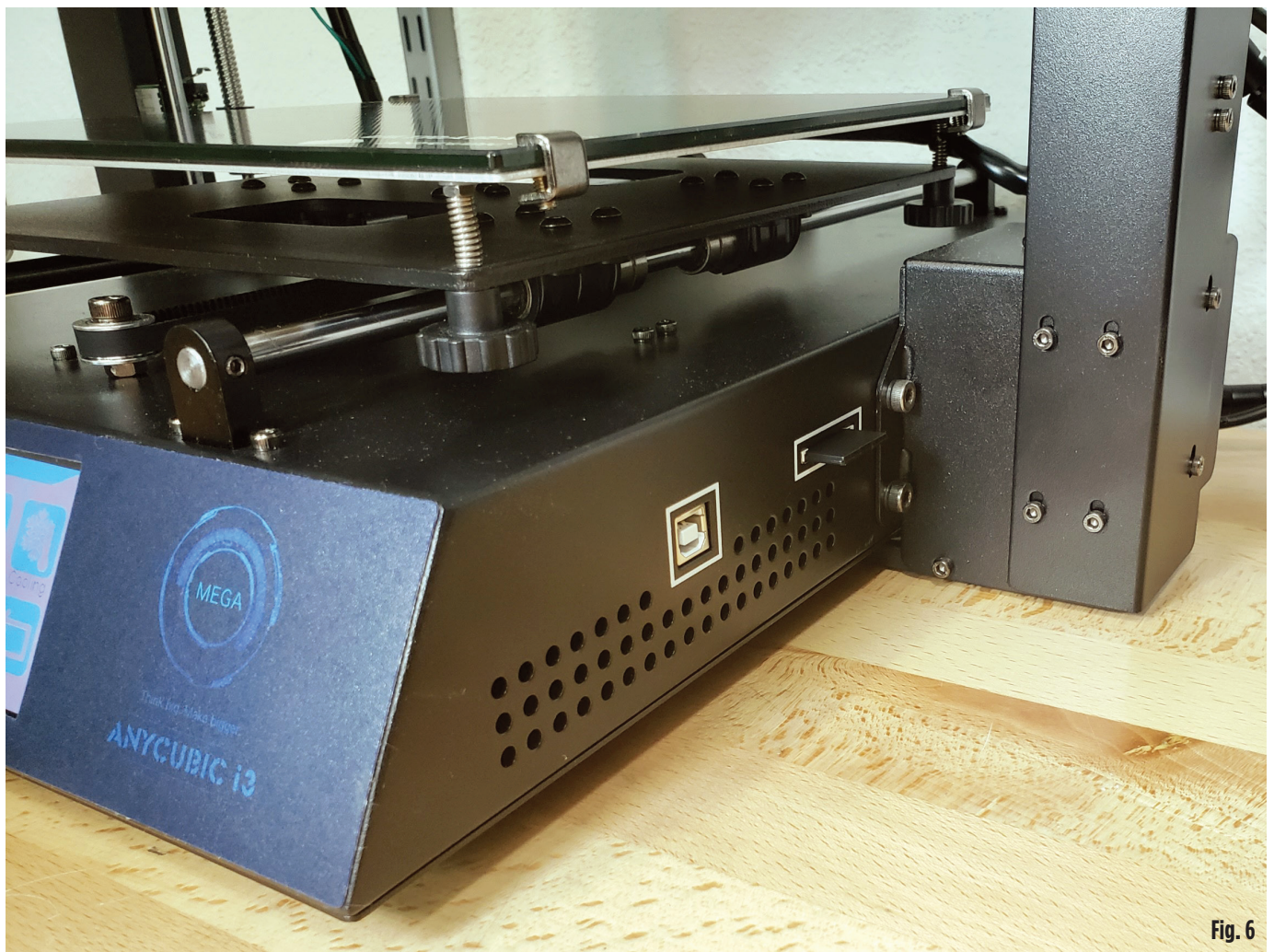


Fig. 6

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

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# Vintage Column Wheel Chronographs—Sequence of Functions Lemania 2310/Omega 321 and Valjoux 72, Part 2

By Bernhard Stoeber, CW21

## A Brief History

Before we now go to the “timing of functions” as it relates to the interaction between the column wheel and various levers, we need to step back in time and look at the history of mechanical chronographs. The chronograph as we know it today was invented during the first and middle parts of the 18th century. Watchmakers from the famous Vallée de Joux in Switzerland played a key role in the development. The start-stop and return-to-zero function became available in 1862, but the chronograph section was located on the dial side. It moved to the movement side in 1878 and was then subsequently used in the form we are familiar with today. These chronographs were single-button pocket watches; the introduction of a single-button wrist chronograph followed after 1910. The two-push-button chronograph appeared in the mid-1930s.

Given the manufacturing technology of the late 19th and early 20th centuries, the parts of the chronograph mechanism were not consistent and had to be hand-fitted by filing and polishing during the assembly process at the manufacturer. Likewise, replacement parts during service needed to be fitted by the watch repairer. Interchangeability for most of the components was introduced in the 1940s, but some parts still needed to be fitted during service. This is true especially for the fly-back lever (hammer) that usually had to be adjusted by hand, as I know from working on the Omega 321 and the Valjoux 72. We will cover this subject in more detail in a subsequent part of this series. *The Chronograph—Its Mechanism and Repair* by B. Humbert provides a good historical overview of these developments.

I recommend studying the following books that deal with column wheel chronographs, their functions, and adjustments:

*The Chronograph—Its Mechanism and Repair* by B. Humbert, published by Edition Simonin. Especially important are pages 7-9 and 15-19 where the author described in detail the chronograph functions. On pages 20-22 the author covers adjustments of levers by filing and polishing.

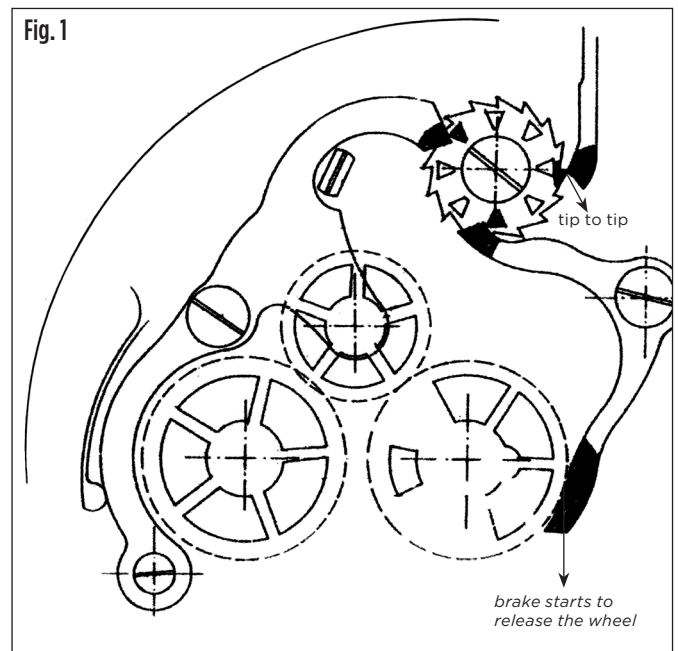
A wonderful resource is the Esembl-O-Graf series of books by William O. Smith Sr. and William O. Smith Jr., especially Volumes 4 and 24. Volume 4 covers Valjoux 23 (minute counter only). Volume 24 covers the Valjoux 72 mechanism (hour and minute counters) extensively. Likewise, Volume 14 is dedicated to the Lemania 2310 (or as it was known then, CH27).

*A Guide to Complicated Watches* by Francois LeCoultre, published by Edition Simonin, is a must-have in any horological library. A revised and expanded English version is being developed.

The following is a detailed outline on how to properly check the “Timing/Phasing of Functions” for **Lemania 2310** using the column wheel tool:

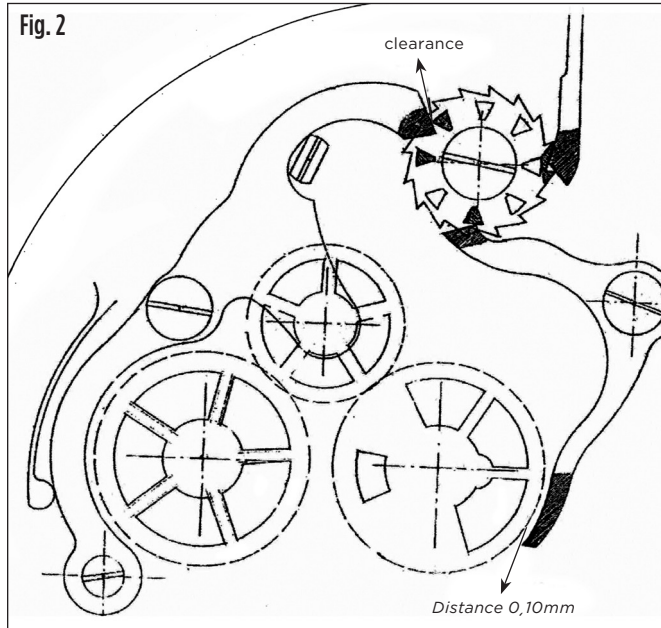
### Start (Chronograph engaging):

- Fly-back lever (hammer) to be lifted before the “critical point” (tip-to-tip position).
- Intermediate chronograph wheel (clutch wheel) descends into seconds chronograph wheel after the “critical point”.
- The brake starts to lift at about the same time.



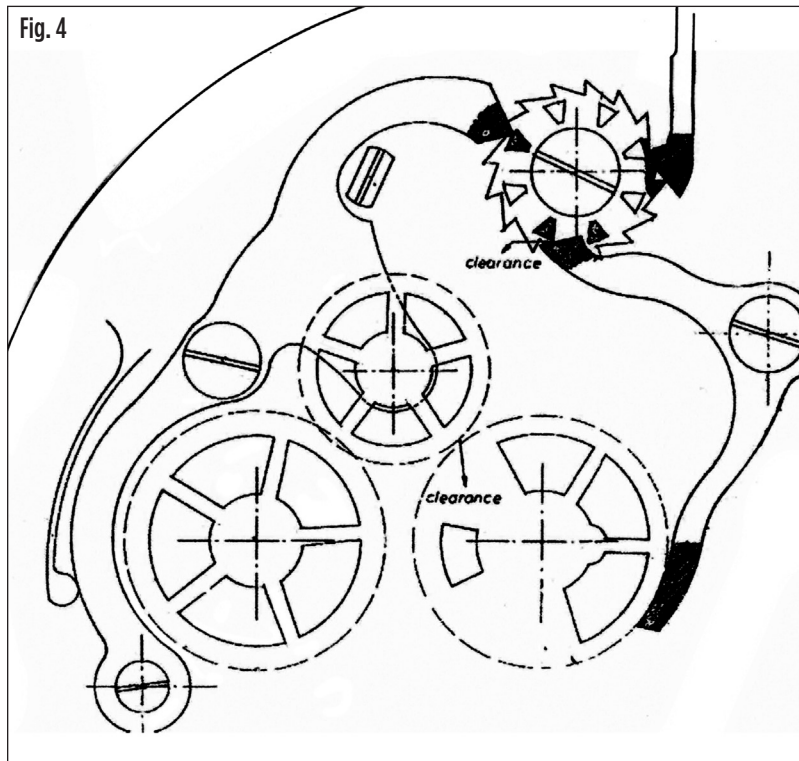
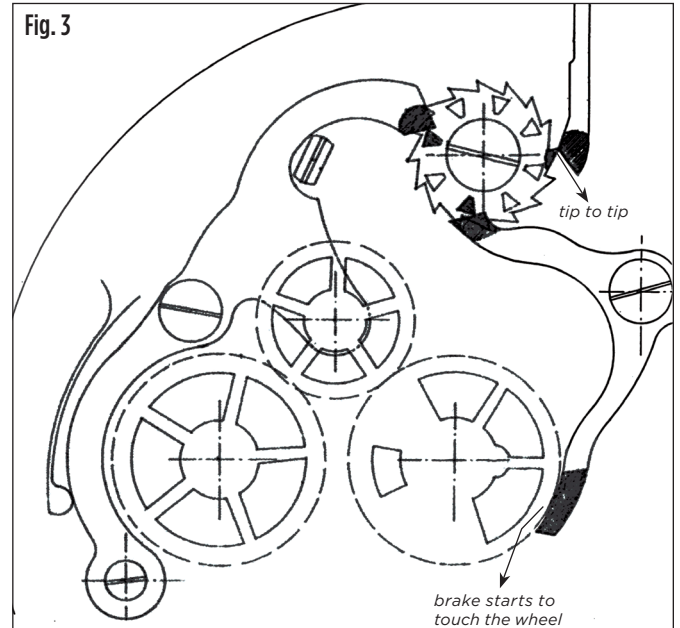
### Chronograph engaged:

- Clutch lever rests against the eccentric post.
- The beak of the lever stays clear of the previous column of the column wheel.
- The brake is lifted.



### Stop (Chronograph disengaging):

- The brake touches seconds chronograph wheel at “critical point” or shortly thereafter.
- Clutch lever is lifted shortly after the brake touches the wheel.
- The hammer remains lifted.



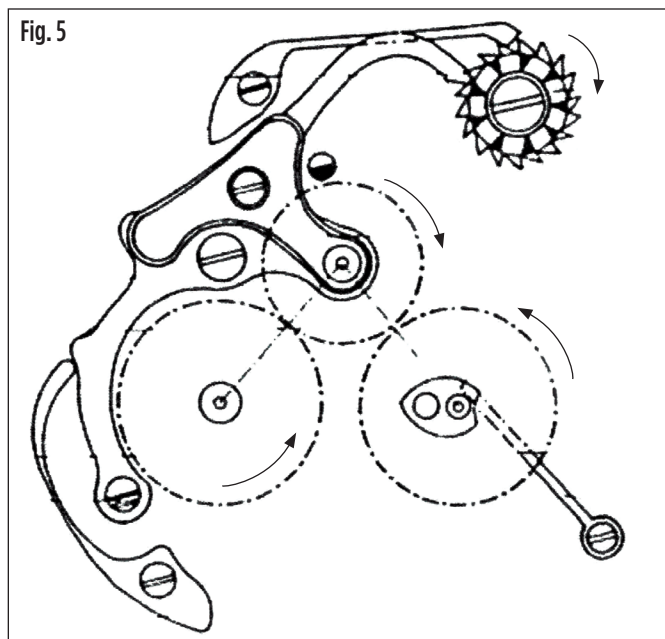
### Chronograph disengaged:

- The beak of the brake is in between two columns, and the brake touches the chronograph seconds wheel.
- The clutch lever beak rests on a column, and the clutch wheel is disengaged from the chronograph seconds wheel.
- The fly-back lever remains lifted.

Here are the same sequences for **Valjoux 23/72**. Note the two different designs: 1. with the hammer down in the zero set position for the Lemania; 2. the hammer lifted on the Valjoux:

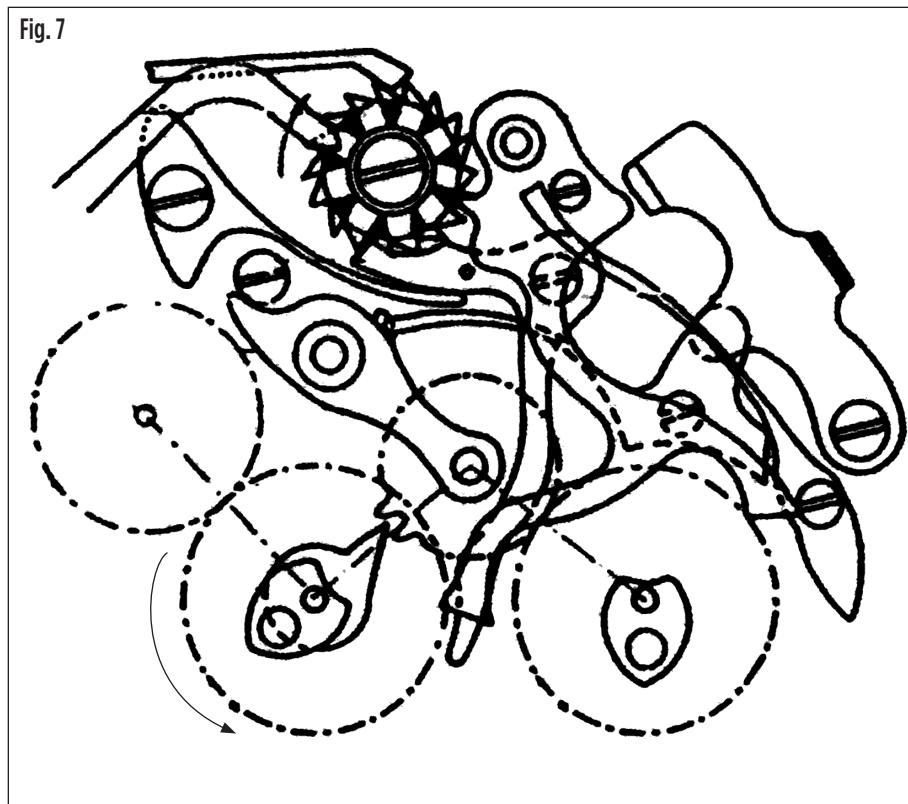
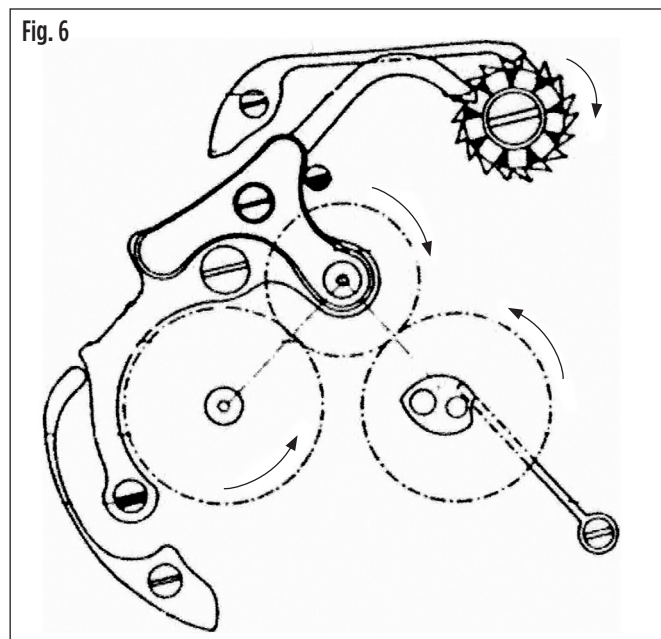
### Start (Chronograph engaging):

- The hammer is still lifted.
- The brake starts to lift at about the “critical point” (tip-to-tip position).
- Clutch wheel descends into seconds chronograph wheel after the “critical point”.



### Chronograph engaged:

- Clutch lever rests against the eccentric post.
- The beak of the clutch lever is in between two columns.
- The brake and the hammer are lifted.

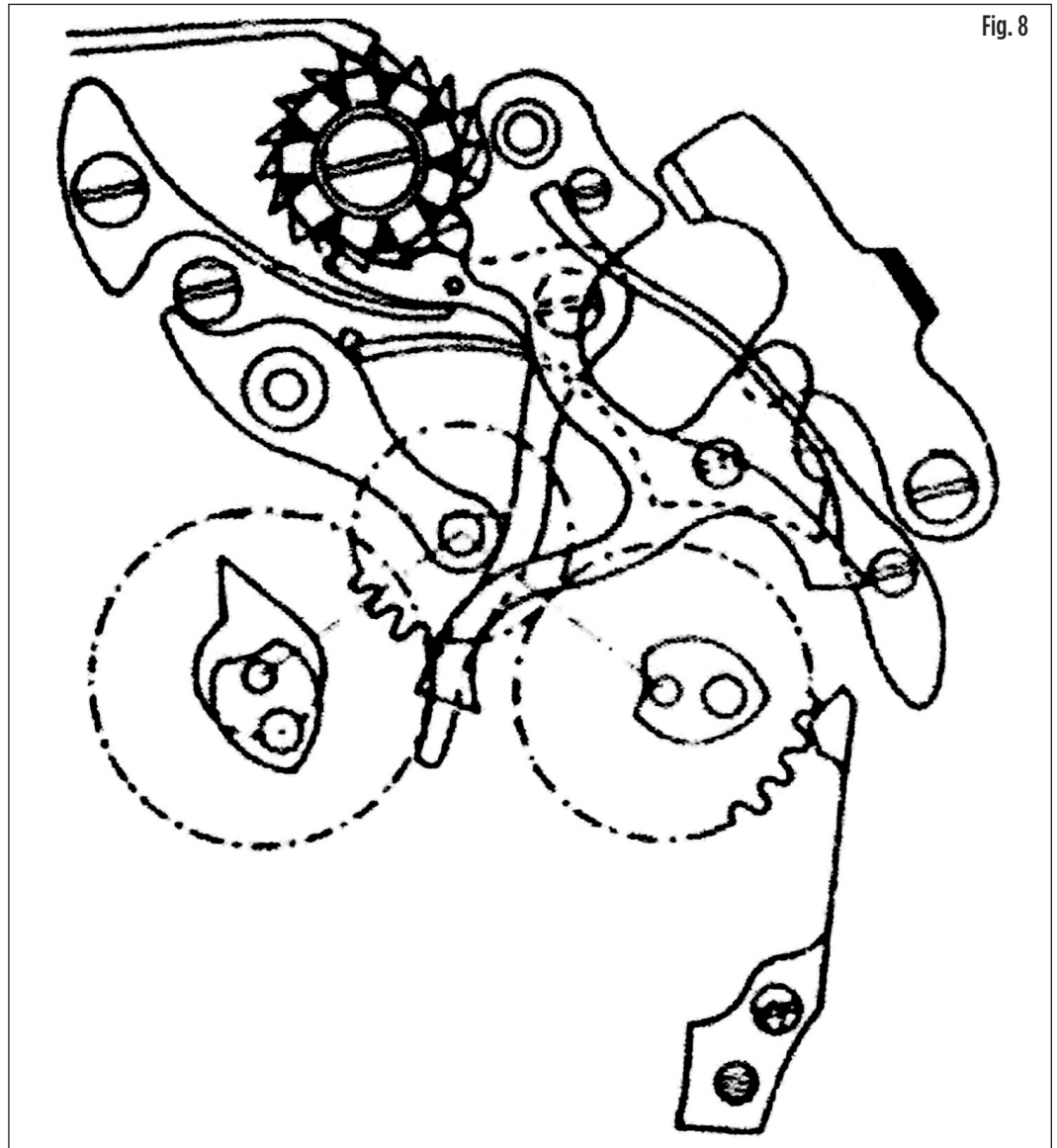


### Stop (Chronograph disengaging):

- The brake touches seconds chronograph wheel at “critical point” or shortly thereafter.
- Clutch lever is lifted shortly after the brake touches the wheel.
- The hammer remains lifted.

## Chronograph disengaged:

- The beak of the brake is in between two columns, and the brake touches the chronograph seconds wheel.
- The clutch lever beak rests on a column, and the clutch wheel is disengaged from the chronograph seconds wheel.
- The hammer remains lifted.



In the next part of this series, we will discuss extensively the minute-counter function and adjustment for Lemania 2310 and Valjoux 23/72 respectively.

---

**Bernhard Stoeber** is an experienced watchmaker who has worked for over 40 years for the Swiss watch industry in Europe, the US, and China (with Omega, Movado Group, and Rolex). He retired from his corporate activities in 2018 and now lives in Mount Joy, Pennsylvania.

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# Apple Releases the Series 5 Watch

By Kathy Ortt

Apple Watch turns five this year and, once again, the teams at Apple have tried to come up with more ways to make their watch a product customers value as a part of their daily routine. With the introduction of the Apple Series 5 watch, the new features getting the most press are the always-on display and the titanium case of the Edition model. A solid gold case was offered when Apple launched the watch in 2014, but not since. The successive editions offered aluminum, ceramic, and stainless-steel cases.

For Series 5, in the upgraded Edition model, Apple brought back a white ceramic Edition model as well as a pair of Edition models in titanium, one in a matte natural color and one in DLC space black. The titanium models start at \$799 for the 40mm and \$849 for the 44mm.



The new emergency calling app on the Apple Series 5 Watch.

With Apple's Series 5 always-on retina display, watch owners no longer need to raise a wrist or touch the screen to see the time or other information on the watch face, because the display never sleeps. The display dims when the wrist is down, but important features, like watch hands, remain visible at all times. Touching the watch face or raising a wrist brings everything back to full brilliance.

New watch faces available are called Meridian, Numerals Duo, and Solar Dial. Any face can be personalized by selecting apps or shortcuts to features. With Apple's commitment to healthy living, many apps are designed with that in mind. Some new

apps are ECG app, heart rate app, noise level app, fall detection app, emergency calling app, cycle tracking app, and breathe app (to reduce stress).

The Apple Series 5 Watch debuted in September with a new case made of titanium.

Photos courtesy of Apple.

Sources

[www.apple.com/newsroom/2019/09/apple-unveils-apple-watch-series-5](http://www.apple.com/newsroom/2019/09/apple-unveils-apple-watch-series-5)  
[www.hodinkee.com/articles/apple-watch-series-5-review?mc\\_cid=abdb22d0fe&mc\\_eid=458d3d721b](http://www.hodinkee.com/articles/apple-watch-series-5-review?mc_cid=abdb22d0fe&mc_eid=458d3d721b)



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

# Joe Thompson Becomes *Hodinkee's* First Executive Editor

By Donna Hardy

*Hodinkee* has appointed Joe Thompson as its first executive editor. He will be responsible for overseeing the day-to-day editorial operations at the website and working with editor-in-chief, Jack Forster, on the overall editorial direction of *Hodinkee*. Thompson has written about watches and the watch industry since 1977. Prior to becoming executive editor, Thompson served as *Hodinkee's* editor-at-large. Thompson has won nine editorial excellence awards from the American Business Press and two from Sigma Delta Chi, the Society of Professional Journalists, and a Gem Award for Lifetime Achievement from the Jewelers of America. At AWCI's 2017 annual convention, Thompson gave a presentation on the state of the watch industry, titled "Switzerland's Watch Woes: The Impact of Overproduction, E-Commerce, Smartwatches, Millennials, and More."



Veteran watch journalist Joe Thompson becomes *Hodinkee's* first executive editor.

Photo courtesy of *Hodinkee*.

Source  
[Hodinkee.com](http://Hodinkee.com)

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

## Due to Heavy Demand Apple Works with Independents

By Kathy Ortt

Independent repair shops in the United States will be the first to work with Apple on a new repair venture. Independents will have access to official parts for out-of-warranty repairs to iPhones. These parts will be the same price offered to authorized service providers that perform warranty work. According to Apple, this arrangement will ease heavy demand on fixing cracked screens and damaged charging ports.

Source  
[www.reuters.com/article/us-apple-repair-idUSKCN1V1F1?fbclid=IwAR34S3M28vP1q4kv\\_xPQEC4fMCSKa6-Cw-huwVHw4\\_BJ26GOWnpChNQMZCU](http://www.reuters.com/article/us-apple-repair-idUSKCN1V1F1?fbclid=IwAR34S3M28vP1q4kv_xPQEC4fMCSKa6-Cw-huwVHw4_BJ26GOWnpChNQMZCU)

## Dallas Gold & Silver Exchange, Inc., Secures Swatch Group Account

By Kathy Ortt

Dallas Gold & Silver Exchange, Inc. (DGSE), has secured a parts account with Swatch Group. DGSE buys, sells, and repairs pre-owned watches from top Swiss brands like Rolex, Breitling, Omega, TAG Heuer, and others. With this account, DGSE will now be able to service with genuine factory parts Swatch Group timepieces, such as Omega, Longines, Rado, Tissot, Mido, Hamilton, and other watches using Swiss ETA movements. To qualify for the Swatch Group parts account, DGSE's horology professionals underwent training and testing at the Swatch Group's service center near New York City. The repair staff at DGSE are also WOSTEP trained.

Source  
<https://finance.yahoo.com/news/dgse-lands-swatch-group-parts-130000268.html>

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



# From the Workshop

By Jack Kurdzionak, CW21, FAWCI

## History Repeats Itself, But Not Exactly in the Same Way

I was reading some postings on an Internet horology group when I came across a link to a *New York Times* story from 1982. Rather than a story about something in New York, this story featured downtown Boston's then-current watchmaking scene, and did it bring back a lot of memories! If you wish, you can check out the link yourself to read about an era that is long gone but was representative of the jewelry district in any large American city of that era.<sup>1</sup>

My watchmaking career began in 1970 with a career change that was facilitated by the large number of watchmakers and material houses located in a very small commercial area in downtown Boston. There were three sprawling, multi-story buildings (each informally known as the “jeweler’s buildings”) that accommodated hundreds of tiny shops housing one or more watchmakers, clockmakers, jewelers, and other related craftsmen. Because there was such a concentration of business located in those three buildings between 333 and 387 Washington Street, numerous supply houses also were located in the same three buildings. Boston had 10 watch material dealers, and I do not know how many jewelry supply businesses, all located within a couple of minutes’ walk from each other. Although I did not recognize it at the time, this was a unique opportunity for young watchmakers to learn from such a wide variety of talent and have almost unlimited access to parts and supplies.

I visited those buildings at least twice weekly and got to know many of the watchmakers in downtown Boston, finding most of them to be gracious and helpful. I was flattered when they invited such an inexperienced watchmaker as myself to join the Massachusetts Watchmakers Association (now MWCA) in 1971. Those watchmakers were mostly in the prime of life. Many of them were WWII veterans who attended one of the many watchmak-

ing schools that flourished at the end of that war. Their frequent MWA meetings were lively affairs, often with as many as 50-75 members in attendance to meet and hear speakers such as Henry B. Fried, Orville Hagans, and Henry Frystak. In addition to those talented speakers, they featured meetings with representatives from almost every major watch company including Patek Philippe, Rolex, Bulova, and so many others. Unfortunately, this era was short lived, and its end was documented in the *New York Times* article. By 1982, the Swiss watch industry was literally on its deathbed and in need of intensive care. The Japanese watch industry had dealt a double, nearly fatal, blow to Switzerland when they introduced low-cost and high-quality mechanical watches to the world in the 1960-75 era. This was followed by a flood of even lower cost, but still high quality, quartz watches. The Swiss watch industry was in a state of turmoil. Hundreds of small Swiss watch companies disappeared. The huge ebauche cartel, Société Générale de l’Horlogerie Suisse SA (ASUAG), was bordering on bankruptcy. The other group of watch manufacturers that sold complete watches, Société Suisse pour l’Industrie Horlogère (SSIH), was near collapse. Employment in the Swiss watch industry was down over 65% with no bottom in sight. The malaise spread all over the country and Boston was no exception. Those hundreds of small watch and jewelry shops located in the “jeweler’s buildings” saw business plummet just as their owners were approaching retirement age but still needing to work a few more years before they qualified for retirement benefits. Within a few years, beginning in the late 1970s, many of these small shops closed. Additionally, as the watch repair business declined, the watch material houses disappeared one after another until there were no remaining full suppliers of watch material in Boston. Only a handful of watchmakers remained in those three buildings to eke out a living.

1. [www.nytimes.com/1982/07/22/us/times-changing-for-watchmakers.html](http://www.nytimes.com/1982/07/22/us/times-changing-for-watchmakers.html)

Two watchmakers highlighted in the *Times* article, Israel Snapper and Frank Torre, lamented the changes taking place but eventually closed shop and retired. Frank Torre left to become the watch repair instructor at the North Bennet Street School in Boston for a few years until that program was closed. The few young watchmakers who did not quit continued working in the profession through the 1980s and into the 1990s when the Swiss watch industry had a renaissance as consumers rediscovered the delights of mechanical watches. Once again, watchmaking became an attractive profession. This time with better salaries, working conditions, and benefits.

The number of watchmakers never again regained its postwar level, but it did grow somewhat for a while. That is, until the next market shock occurred. This time it was not the Japanese manufacturers but the Swiss watch industry itself. One by one, watch companies and their distributors began to limit the sale of spare parts, discontinue the dissemination of technical information, and set up their own service centers for their respective brands. That is where we are today.

Once again, as in 1982, I hear watchmakers speak of trying to keep working until they qualify for Social Security and Medicare. The same age group that was deeply impacted in the early 1980s is similar to that which is affected today. Their comments are almost the same when they speak of the better times in the past, and the bleak future they foresee of the profession. Just before Israel Snapper retired, I remember seeing him at a Boston material house getting a stem for a then-current-model Bulova quartz watch. He bitterly complained to the other customers that he normally would not work on such junk but that

was all that was coming in for repair. Complaining about a challenging situation is easier than meeting the challenge. It was then in 1982 and it is the same today. Complaining may have an audience but accomplishes nothing.

There is no way to predict the future of our profession. I can say that it has evolved over the years as it has responded to several market shocks, as well as the normal gradual changes that take place in any business. Will there be a future for watchmakers? Yes, there will be. Will it look different than it does today? You can bet it will. When I meet young watchmakers (anyone 30+ years younger than I am), I have to believe there will be a future in this profession for them. My job, as well as that of other senior watchmakers, is to encourage them to continue, and accommodate to the changes they will witness during their careers. That is how we, of the now-older generation, continued the profession long after the earlier industry turmoil highlighted in the *Times* article. If we had paid attention to the pessimism of Israel Snapper and his colleagues, we would have quit 40 years ago. History may have repeated itself, but our positive response can also repeat itself so that, in future years, there will be a viable watchmaking profession.

## Contemplation and Thanksgiving

Suddenly, we are nearing the end of another year. As this month ends, we have a special opportunity to stop for a couple of days to enjoy our special American holiday, Thanksgiving. It is a unique opportunity to appreciate our family and friends and whatever good things we have received in our lives. My best wishes to you during this unique time of the year.

# DIY Tool Maker

## Screwhead Slotting Assistant

By Hans Schwarz, CW21

The screwhead slotting assistant reduces the difficulty in creating straight and centered freehand screw slots. Slotting is one of the last operations to be performed when fabricating a custom-made screw and should, therefore, have a high reliability of success.

Place the screw to be slotted into a pin vise and, in

turn, place the pin vise into a standard vise as shown. Adjust and tighten the thumb screw of the tool so that the blade is perfectly positioned to guide your cut with the slotting file. The slotting assistant is symmetrical, so both left- and right-handed watchmakers will be comfortable using it.

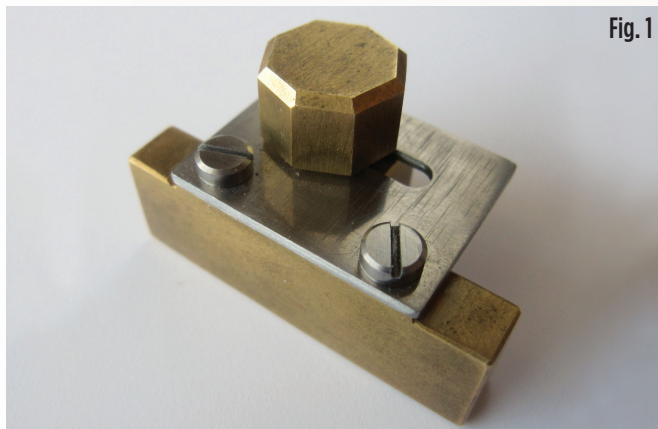


Fig. 1



Fig. 2

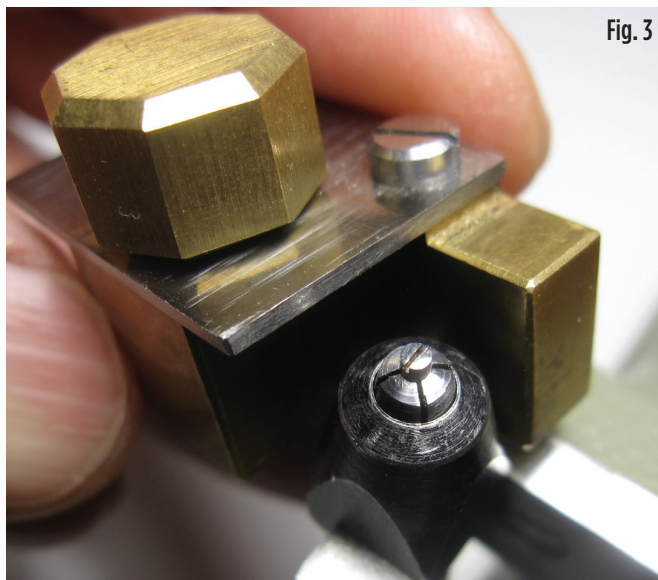


Fig. 3

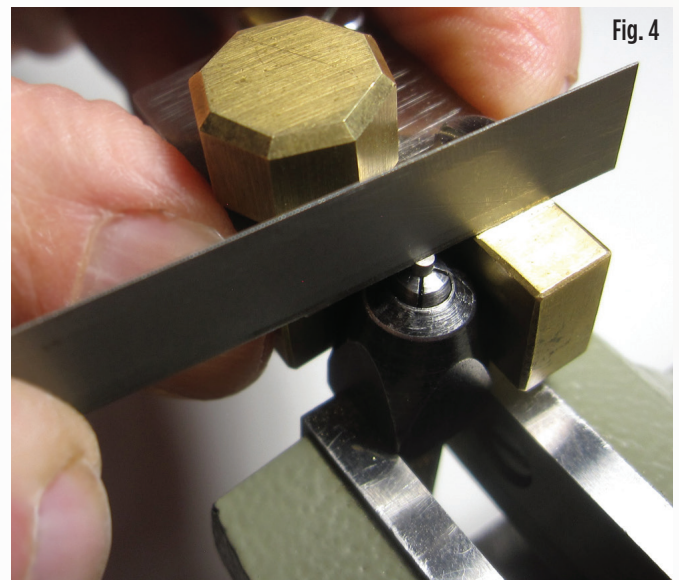
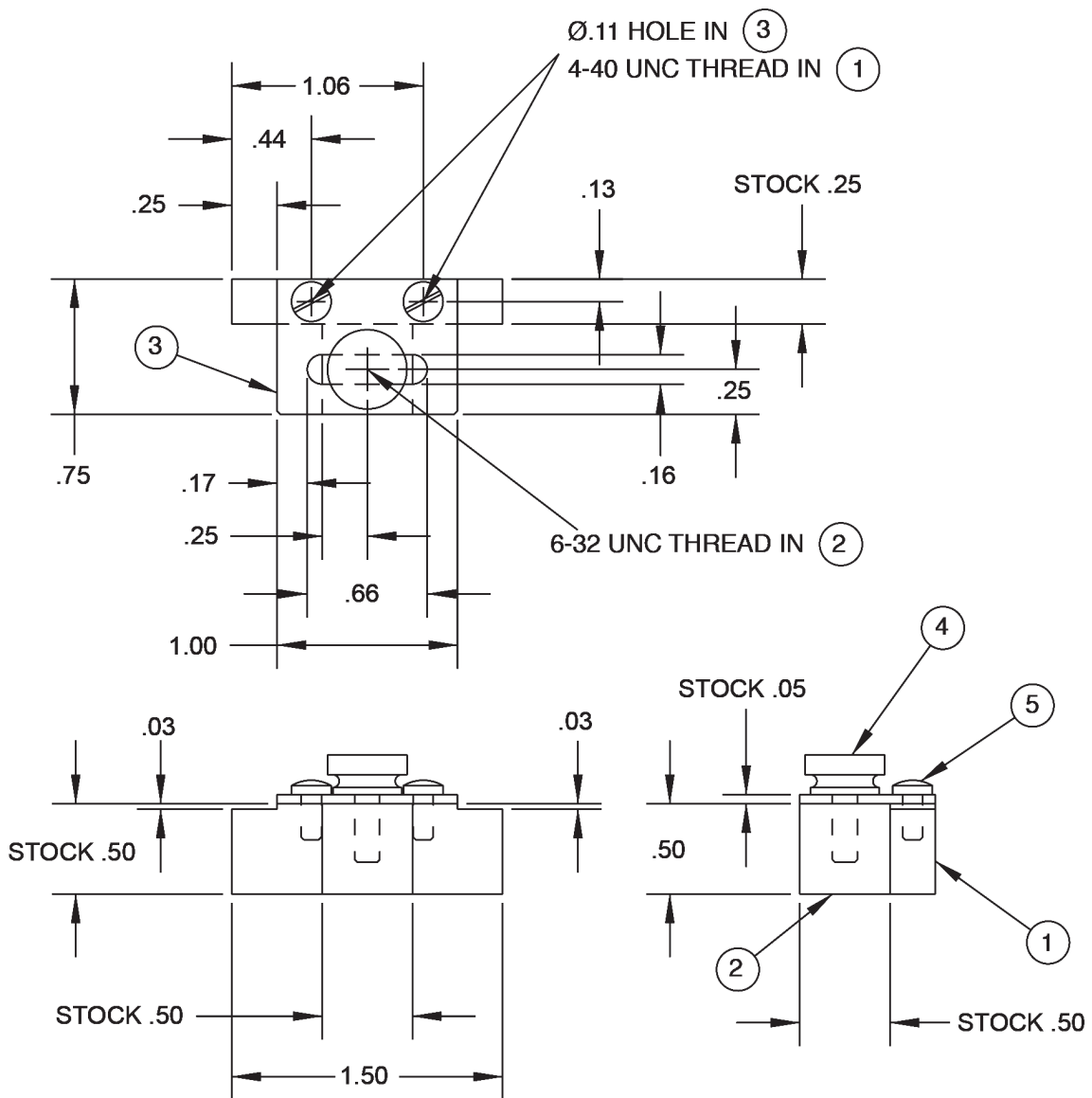


Fig. 4



(5)	PURCHASED PART - 2X 4-40 UNC PANHEAD SCREW
(4)	PURCHASED PART - 6-32 UNC THUMB SCREW
(3)	MAKE FROM O1 TOOL STEEL. HARDENED, TEMPERED TO BLUE, POLISHED
(2)	MAKE FROM 360 BRASS
(1)	MAKE FROM 360 BRASS

DIMENSIONS  
IN INCHES

## SCREWHEAD SLOTTING ASSISTANT

## Horological Society of New York (HSNY)

*The following information was obtained from The Horologist's Loupe, submitted by Carolina Navarro, Director of Public Relations, HSNY, Copyright©2019. Published by the Horological Society of New York, Inc.; all rights reserved.*

At the October HSNY meeting, Maria and Richard Habring, founders of Habring<sup>2</sup>, Uhrentechnik OG Völkermarkt, in Austria discussed their approach to manufacturing affordable, high-quality mechanical watches in small series, and how that contrasts with their former jobs working for large watch companies. At the beginning, the Habring<sup>2</sup> relied on outsourced movements and components. When the Swatch Group/ETA began to restrict supply of movements to third parties, Habring<sup>2</sup> began manufacturing their own movements. In 2014, they presented the Felix, which is powered by their proprietary A11 movement. Maria and Richard Habring discussed how Habring<sup>2</sup> developed the A11 movement from conception to final design. The Habrings also spoke about the technical development process and the financial aspects of developing a mechanical watch movement.

## HSNY OFFICERS

**President:** Nicholas Manousos

**Vice President:** John Tiefert

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

## Minnesota Clockmakers Guild (MCG)

For the October MCG meeting, the program was the viewing and discussion of Eli Terry's Porter Contract wooden works clock plans by George Bruno. Another part of the program was a demonstration and explanation of UV glue showing how it is cured with ultraviolet light.

For the September meeting, Ivy Booth shared a collection of old "Bench Tips" from the files of MCG and presented them. Dan LeVesque offered a few samples of HC 32 lubricant for members to test on clocks and report how it works.

For Show and Tell, Susan Wood shared her casting technique and material used to make a replacement number "1" for a dial. Richard Zielike shared a dial with shipping damage. MCG members discussed methods that could be used to straighten it. Zielike also shared the small plastic gear on a music box fly and asked if it could be repaired or 3-D printed. Ken

Danner shared a plastic gear from a Regula movement and asked if a small pin tooth, at six o'clock, could be repaired. Garth Antila shared the 3M patch compound he used to secure a replacement vial in his precision level. Elroy Anderson shared how to use an insert to change the thread size for the T-nut used with a clock test stand.

## Future MCG and Affiliated Clock Meetings

**November 7, 2019** – MCG Meeting – TBD

**December 5, 2019** – MCG Meeting – TBD

## MCG OFFICERS

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

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

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

## Watchmakers Association of New Jersey (WANJ)



WANJ members attended a lathe class taught by Jason Champion on the mobile horology classroom.

## WANJ Officers

**President:** Richard Cuny

**Vice President:** Adolph Stonitsch

**Treasurer:** Dale Sutton

**Secretary:** Dr. Henry Shotwell

In the September installment of Affiliate Chapter News, HT covered a Build a Watch class co-instructed by North Carolina Watchmakers Association (NCWA) member Scott Walters. A Build a Watch class participant was incorrectly identified as Francis Gilmore. Pictured here is the actual Francis Gilmore who participated in the class.



Bottom right: Francis Gilmore.

## Do you enjoy spending time with other watchmakers and clockmakers?

# Join Your Local Affiliate Chapter

for more information log on to [awci.com/about-us/affiliate-chapters](http://awci.com/about-us/affiliate-chapters)

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**Horological Association of Virginia**  
 Billy Best, President  
 3414 Wakefield Ave  
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 540-797-2357  
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 715-682-3155

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[thechronometerclub@gmail.com](mailto:thechronometerclub@gmail.com)  
[www.thechronometerclub.org](http://www.thechronometerclub.org)

# The Watch Repairer's Manual

by Henry B. Fried



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

**\$59.99**

Written by Henry B. Fried, dean of American watchmakers, BHI Silver Medalist, and honored teacher, this book is the perfect reference for the beginner, the trade watchmaker, hobbyist, collector, or anyone interested in horology.

To order, go to the online store at [www.awci.com](http://www.awci.com).

**Recommended reading for CW21 certification**



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President of AWCI's Board of Directors  
[aaron@awci.com](mailto:aaron@awci.com)

**"If you have thought about getting involved in AWCI, I can find the most effective use of your time while you help add value to our profession."**

-Aaron Recksiek, CW21

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## President’s Message (cont. from page 5)

membership and the *Horological Times*. These changes combined with paying off the mortgage and utilizing a more favorable tax status of the ELM Trust on some of our charitable endeavors set us up to be even more financially stable. That means we can work on some of the additional projects we’ve had in the queue to provide more benefits to members.

During our board discussions, we also realized that there may be a perception problem with AWCI as it pertains to our independence. We value all our IAB members, and we appreciate the contributions they make to be a part of AWCI. However, let me be clear: the board does not make decisions based on the size of the check that is written to AWCI.

I look forward to serving as your president for the next year, and I can’t wait for all the fun things we have planned. The staff at headquarters are already preparing for the events they will be hosting during our Convention & Educational Symposium in March 2020. Our 60th anniversary! It will be a big deal, and I expect to see the biggest turnout I’ve ever seen at a convention. See you there! 🌀



New directors were sworn in during the annual board meeting in October in Harrison, Ohio. From left to right: Henry Kessler, IAB; Craig Stone, director; Andrew DeKeyser, director; Dave Kurdzionak, Affiliate Chapters.

## Executive Director’s Message (cont. from page 5)

when you renew is that AWCI has lowered your dues for the first time in AWCI history. Regular membership is now only \$150. We encourage you to renew online with your credit card. Our payment processing is handled by a secure processor, and you have no need to worry. You can even set up automatic renewal so that your payment is processed each year on January 1.

You can learn more about this exciting reduction in membership cost and other exciting changes the board implemented on page 9. 🌀



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

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## Membership Pin

\$12.95



**Check out our website for these and other great items!**  
If you need assistance, contact AWCI at 513-367-9800.





# The Archie Perkins Mobile Horology Classroom

The AWCI Board of Directors has made a historic decision that will change the future of horological education in the United States. We understand it is difficult to leave the workshop and travel to receive training, so AWCI will be bringing education directly to you in the places where you live and work. The Archie Perkins Mobile Horology Classroom is part of a renewed effort to expand our educational offerings to include all segments of the horological community, including professional watchmakers, professional clockmakers, sales and support staff, technicians, collectors, and anyone with an interest in horology. The Mobile Horology Classroom will be the first of its kind anywhere in the world!

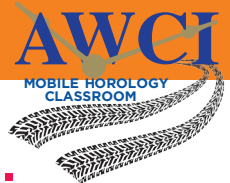
AWCI construction of the Archie Perkins Mobile Horology Classroom is finally complete! The mobile classroom will travel all over the United States offering horological education at every level.

The classroom will provide a much better learning environment than what can be offered in a hotel meeting room or conference room. The classroom will accommodate eight students and one instructor with custom-made, adjustable-height watchmaking benches. Instructional technology will be similar to what is currently available in our Harrison classroom, including a digital microscope, bench camera, document presenter, projector, and monitors. There will be a dedicated cleaning room with automated cleaning machine, ultrasonic, and steamer.

The classroom is ADA accessible with a wheelchair lift and accessible restroom to accommodate the needs of every individual.

When the Archie Perkins Mobile Horology Classroom arrives in your city, you can expect it to stick around for one to two weeks. AWCI will offer a class for professional watchmakers as well as one for clockmakers. We will team up with local jewelers and AWCI members to host collectors' events and classes and to provide technician training for sales and support staff. If you are interested in bringing the classroom to your city, please contact our education director, Jason Champion, CW21, [education@awci.com](mailto:education@awci.com).

**We look forward to seeing you in our mobile classroom soon!**



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Call us before you sell your parts, tools, and watches. We have helped over 200 watchmakers in the last 20 years to dispose of their accumulations. When you're really ready to sell, we're ready to buy!

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

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- AWCI Code of Ethics

# awci directory

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<b>Clocks Magazine</b> clocksmagazine.com	
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<b>Kessler Batteries/Sony</b> 800-527-0719	...back cover
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