

HOROLOGICALTM TIMES

May 2004



American Watchmakers-Clockmakers Institute

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COVER

This month's cover features the
A. Lange & Söhne Double Split



President's Message

Jack Kurdzionak, CW

Last month your board approved the change in our acronym from AWI to AWCI. Several years ago, the American Watchmakers Institute changed its corporate home from Illinois to Ohio. At that time, our actual corporate name was changed to the American Watchmakers-Clockmakers Institute. This was done to reflect the change that had occurred in our membership base, which was at one time almost exclusively comprised of watchmakers. The board concurred that it was proper to include clockmakers in our name to reflect their membership numbers. Clockmakers comprise 40% of our total membership. The one change we never made was to actually refer to ourselves as AWCI. We continued using the old acronym, AWI, although it did not coincide with our actual corporate name.

At the annual meeting last year the acronym change was discussed, but it immediately became apparent to all that this change elicited strong emotions from many members who were there. The issue was referred to committee, not to kill it, but to gather information upon which we could base a decision to change or not change the acronym. The committee met and unanimously recommended a change in the acronym. This recommendation was posted on our chat room, AWI (now AWCI) Matters for further discussion while the board considered the change. Finally, the full board voted (8 to 4) to change the acronym.

We will continue to distribute literature with the old acronym until it is gone, at which time the replacements will be printed with the new acronym so that there will be no additional costs associated with the change.

Although that change generated considerable controversy, it was by no means the most important item we have been working on. Jim Lubic and I along with our educational consultant, Vince Schrader, and IAB Director, Tony Riggio have been talking with executives from several Swiss watch companies. The discussions have been both frank and comprehensive, and have resulted in an understanding that AWCI and the watch industry can work together in an informal partnership that can be beneficial to our membership and the Swiss watch manufacturers and distributors. AWCI certification, continuing education, standardized testing procedures, and their relationship to repairing quality Swiss watches were topics included in the discussion. We have also been assured that these companies have no intention to discourage or prevent qualified AWCI members from repairing their products. In fact, these companies wish to encourage a new spirit of partnership with us so that we can work together for our mutual benefit. It is too early to speculate about any benefits for our members that might result from these discussions except that we are very encouraged with this new spirit of cooperation.



Executive Director's Message

James E. Lubic, CMW

AWCI continues to work on behalf of our members. By implementing a Strategic Plan, AWCI has been able to stay focused on the needs of our members. The fruits of that focus are beginning to pay off. President Kurdzionak's message alludes to two of the items that are part of that strategic plan. In this plan reaching out to our clockmaker members was a vital portion of that plan. Hopefully now the 40% of our membership who are clockmakers will see that AWCI is making that effort. Content in the *HT* also shows our commitment to this endeavor. Now we need to address the advertising of clock related materials in the *HT*.

We can also formally announce our new, yet the same, toll free number 866-367-2924, translates into 866-367-AWCI. Remember that all contact information for office personnel is listed in the back of each magazine. Do not hesitate to use the toll free number to contact us with your questions or comments.

Secondly, President Kurdzionak informs you of the discussions we have had with industry members. AWCI cannot be successful if we don't have a relationship with industry, both watch and clock. The Education Committee has been busy working on the Certification Committee's recommendations for implementation of these new standards. This is a very big job, and I can assure you that this continues to move forward. We have conducted our first Certified Watchmakers pilot exam at Gem City College, with a second scheduled for the week of May 17th at AWCI. The third and final Certified Watchmakers pilot exam will be conducted at the Lititz Watch Technicum in Lititz, PA. Limited spaces are available for participating in these pilot exams. Implementation of this new exam will be July 5, 2004.

Work also continues on the new Certified Clockmakers exam. The committee has had numerous conference calls and will soon be announcing the availability of pilot exams in this discipline as well. If you have an interest in participating in one of these exams please contact Nancy Wellmann at AWCI toll free 866-367-AWCI (2924) or e-mail her at nwellmann@awi-net.org. If you have already contacted her expressing an interest then you will be contacted when more information becomes available.

Another part of the strategic plan is to increase member benefits, and I have two more to announce this month.

First, AWCI has partnered with Intercorp to provide AWCI members with a Horological Insurance program that will cover our members' watch and clock inventories. This insurance will cover both new inventory and/or collections. This coverage comes with a bonus benefit of discount shipping rates through FedEx. See the ad on page 21, and feel free to contact Intercorp at 800-640-7601 for all the details.

The second new benefit is discount websites for our members. A website can be a very valuable tool in today's world. We will have more details next month. I can tell you that there will be two options, one is a two-page "Business Card" website for \$8.95 per month with a one-time domain registration fee of \$9.95. The second option will be "The Works" for \$18.95 per month, unlimited pages and no fee for domain registration. In the meantime, you can check it out at www.awci.companysitecreator.com.

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Questions & Answers

Question

Can you help me with pertinent information concerning a Charles Lodtmann 18k hunting case pocket watch. Both dial and movement have Chaux-de-Fonds on them as you can see. It has a very unique winding/setting system along with the custom crown cover. The setting is engaged by pulling out the lever @ 4:30 position but you must push down the button in the center of the crown to re-engage the winding. I have never seen this system before. My customer would be



very interested in any information you could supply. This particular piece is engraved outside the inside back cover "November 3rd, '81." It doesn't appear to have ever been worked on.

*Steve Ireland
Muncie, Indiana*

Answer

I could not find any reference to Charles Lodtmann being a maker of watches. But I can tell you that your watch was probably made from an ebauche made by the International Watch Company of Schaffhausen, Switzerland; and appears to resemble their Savonette Calibre 84, made around 1890.

An ebauche was a blank movement with wheels and a main-spring barrel, uprighted between the plates of the movement; but without jewels, escapement or balance. The maker, whoever he was, would then fashion the top plates and bridges to

his own design; jewel the wheel pivot holes and add an escapement and balance, either of his own manufacture or purchased from an escapement maker and a balance maker to conform to the maker's own requirements for precision and performance; and then apply his own surface treatment and finish to all of the components. The ebauche was probably finished by a maker in La Chaux de Fonds.

Charles Lodtmann could have been an exporter, dealer or retailer of watches who had his name added to the movement and dial. The movement is obviously of fine quality and finish.

As to the winding/setting mechanism: without seeing the watch, I would guess that the winding pinion sticks in the wind position when the setting lever is pulled out; pushing the crown button probably forces the pinion back into wind position. Cleaning and lubrication would probably return its function back to normal.

*David Christianson,
CMW, CMEW, FAWI,
Technical Editor*



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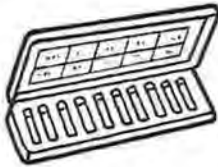
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Ask Huck

Mainsprings of the American Clock

Question

How long is the life expectancy of the American clock? How can I determine if the spring should be replaced?

Answer

These are questions I have heard since I was a small boy. I'm now 83 years old and no one can agree on the answer. So, I'll tell you what I do—and a lifetime of experience does not alter the opinion.

An American clock is well powered. A movement in reasonably good condition will run ten or more days on a full wind. These clocks will be around many hundreds of years. The springs sometimes break, but many are now a hundred years old.

A spring that shows no evidence of cracks or rough edges is not apt to break any more than a new spring. If your free spring will expand to eight or more inches in diameter, it will fully power the movement. Do not measure the last outside turn in this test.

A spring that passes the above test can be trusted as much as a new one.

The big problem with these powerful springs is the danger of one that escapes the mainspring clamp. When that happens, your shop is too small for you and the spring for a few moments.

New Mainspring Breakage

When I was a young watchmaker, all of our watch mainsprings were steel. We experienced two types of springs.

1. Those which broke promptly.
2. Those which became too weak to power the watch.

I was taught to wind the spring and let it down several times before installation in the watch. And, then inspect its free size. They often broke in the spring winder, or showed to be set when removed from the winder.

In time past, I did the same with clock springs. Springs now have polished surfaces and edges. Breakage of new clock springs today is so seldom that I do not go through that routine.

The worst spring story of my life was around 1960. I had a little German clock in the shop with a broken spring and two broken pivots. I ordered a spring, and repivoted the two arbors; assembled the clock near the day end. Next day it was not running. It had a broken spring and several teeth broken in one of its wheels. Now that will make a clockmaker cry.

The good news is this, most of the old springs that were going to break have already done so. And the new springs are much more reliable than those of bygone years.



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The Lange Double Split: The New Era Of Chronography Has Begun

*“A. Lange & Söhne” has just liberated the rattrapante chronograph from its confinement to 60-second lap times by creating the first genuine double rattrapante for the wrist. The new LANGE DOUBLE SPLIT not only has one, but two rattrapante hands – one for the seconds **and** one for the minutes to be stopped. What’s more, both chrono hands and both rattrapante hands are flyback hands.*

The new era of chronography has begun: “A. Lange & Söhne” has extended the functionality of the “watch in the watch” by a fascinating dimension. The intricate complication of a rattrapante sweep-seconds hand in a chronograph has always been an awesome horological accomplishment for short-time measurements. From the very beginning, it was admired as a milestone in precision engineering, but alas, it had its limits. Unfortunately, the possibility of taking a lap-time reading with the rattrapante sweep-seconds hand during an ongoing measurement was restricted to the 60-second scale and thus to laps of less than one minute.

Now, this limitation has been overcome. The “watch in the watch in the watch” has become reality. In the new LANGE DOUBLE SPLIT, the principle of the rattrapante sweep-seconds hand has been extended to the jumping minute counter. This means that for the first time ever, comparative lap measurements of up to 30 minutes—in Formula 1 races, to name but one example – are now possible in a classic, purely mechanical wristwatch.

Also, the act of measuring a lap time does not have to be at the expense of a loss of amplitude when the chrono sweep-seconds hand continues to revolve while the rattrapante sweep-seconds hand is stopped. This is prevented by a disengagement mechanism developed by “A. Lange & Söhne”, for which a patent registration has been filed.

Once is good, but twice is better

Several years of hard work in the development department of the Lange manufacturing facility are behind these complicated technological innovations. The



new LANGE DOUBLE SPLIT was inspired by the technical refinements once before integrated in a Lange double-rattrapante pocket watch that dates back to the late 19th century. This latest chef-d’oeuvre also spawned the self-confident maxim of Lange’s engineers: Once is good, but twice is better.

Buoyed by the success story of the DATOGRAPH that began five years ago, the engineers systematically evolved an already ingenious timekeeping instrument to create a masterpiece: A 220-gram power pack of horological artistry in a platinum case with a diameter of 43 millimeters. And they endowed this latest juncture in the history of watchmaking with all of the major innovations and complications that since then have been devised at the Lange manufacturing facility in Glashütte. This includes a new balance wheel developed in-house by Lange. Designed for a frequency of 21,600 semi-oscillations per hour, it is equipped with eccentric poising weights instead of inertia screws. It is powered by a Nivarox 1 balance spring which was also developed in-house by Lange and is manufactured on site. It, too, features a technical novelty: It is not attached to a hairspring stud but instead is secured by a balance-spring clamp for which a patent registration has been filed. This clamp perceptibly simplifies the future poising work of the fortunate watchmakers to whom the LANGE DOUBLE SPLIT will one day be entrusted for servicing. Detailed innovations of this kind have always been typical for Lange in the past and will remain Lange hallmarks in the future.

Since it was festively inaugurated in the late autumn of 2003, the manufacturing facility's new Technology and Development Center has been pursuing the kind of fundamental research that Richard Lange, the oldest son of company founder Ferdinand Adolph Lange, embarked upon in 1930 with his patent No. 529945 concerning a "metal alloy for balance springs," an invention that since then has found global acceptance. He discovered that the sensitivity of balance springs to temperature fluctuations could be reduced and their flexibility enhanced with the addition of beryllium. Today, Lange is one of only a few companies in the world that master the latest-generation processes needed to manufacture hairsprings. And these springs are used exclusively for Lange movements.

All these assets are embodied in the LANGE DOUBLE SPLIT, a very special and exclusive horological accomplishment. The best way to understand the beauty and complexity of a precision mechanical universe is to describe its functions.

From the watch ...

With its manually wound caliber L001.1 movement, the LANGE DOUBLE SPLIT is first and foremost a watch that indicates the hours and minutes on its two-tiered black solid-silver dial, the seconds on its silvery subsidiary dial on the left-hand side, and the power reserve with an indicator beneath the Roman "XII". The small seconds dial, the also silvery 30-minute counter dial of the chronograph on the right-hand side and the up and down indicator with its small red hand constitute the



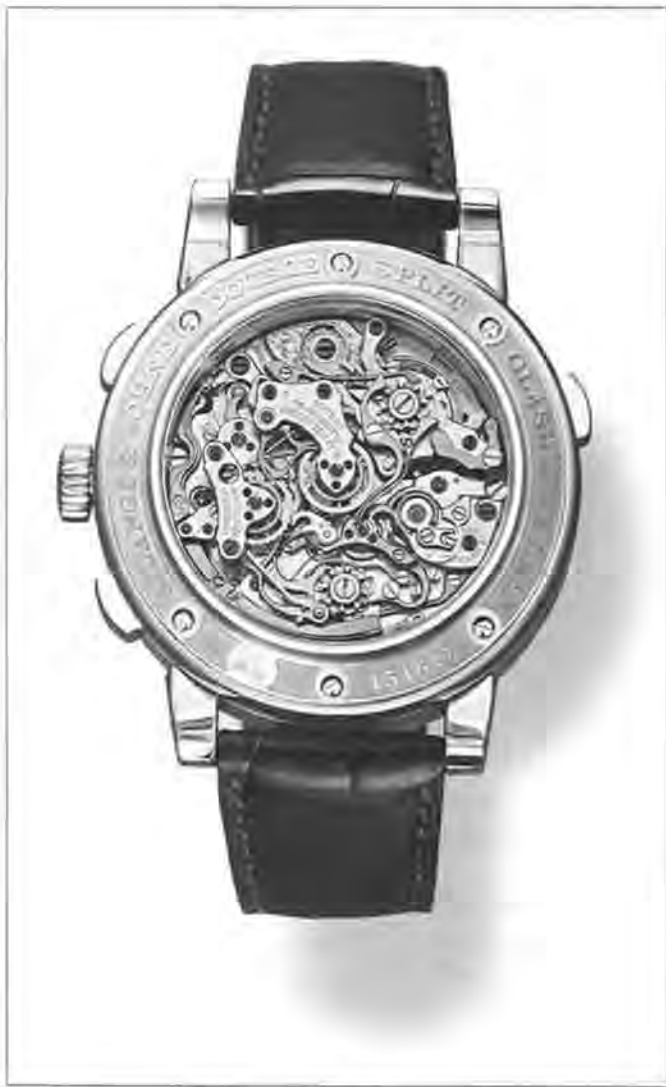
corners of an equilateral triangle, a typical characteristic of the architecture of Lange dials.

and the watch in the watch ...

The chronograph function: When the owner presses the start/stop push piece of the chronograph, subtly rounded to accent the classic circular case, the LANGE DOUBLE SPLIT becomes a "watch in the watch". This action sets the slender gold-plated chrono sweep-seconds hand in motion. When the same push piece is pressed again, the hand stops. When the zero-reset push piece at 4 o'clock is pressed, the sweep-seconds hand returns to the 12 o'clock position.

The chrono minute counter: Each time the chrono sweep-seconds hand crosses the 12 o'clock marker – not before and not afterwards – the gold chrono minute counter advances by one minute marker. Thus, in the "grey zone" on either side of the zero passage of the sweep-seconds hand, there is never any uncertainty as to the accuracy of a measurement.

The flyback function: While the chronograph mechanism is running, both chronograph hands can be instantly reset to zero by pressing the push piece at 4 o'clock. When this push piece is released, the chrono sweep-seconds hand restarts immediately. Its minute counter will advance by one marker precisely one minute later. This so-called flyback device makes it possible to initiate a new measurement without delay. With simple chronographs, the same effect requires the actuation of the start/stop push piece to stop the hands the actuation of the zero-reset push piece to return the hands to the home position, and the renewed actuation of the start/stop



push piece to start the next measurement. The flyback mechanism bundles all of these interventions into one actuation. The idea for this mechanism dates back to an epoch in which pilots needed to coordinate speed, rudder position, and time to fly curves, and fast reactions were needed.

... to the watch in the watch in the watch

The rattrapante function: A further hand is located above the chrono sweep-seconds hand and over the chrono minute-counter hand. The rattrapante sweep-seconds hand, made of rhodiumed steel, hovers over the chrono sweep-seconds hand and the blued steel rattrapante minute-counter hand lies a hair's breadth above the chrono minute-counter hand. During an ongoing time measurement, the rattrapante hands can be used for a separate lap time measurement at any given moment. This is how it works: When the start/stop push piece at 2 o'clock is pressed, both pairs of hands are set in motion simultaneously. The rattrapante push piece at 10 o'clock is pressed to measure the first time. The rattrapante sweep-seconds hand stops instantly,

displaying the measured lap time. For the second measurement, the start/stop push piece is pressed to stop the still-running chrono sweep-seconds hand. This allows the owner to note the second lap time as a separate result or to compare it with the first lap time.

If more than two consecutive measurements are to be made after the hands have been collectively set in motion, the following procedure must be observed: The first lap time, stopped with the rattrapante push piece, must be memorized or written down. The renewed actuation of the push piece causes the rattrapante sweep-seconds hand to instantaneously catch up with the still-running chrono sweep-seconds hand. This process can be repeated as often as desired, as long as the chrono sweep-seconds hand is in motion and the aggregate time measurement has thus not been interrupted.

The rattrapante minute counter: The LANGE DOUBLE SPLIT has a chrono minute counter as well as a rattrapante minute counter. For this reason, the rattrapante time measuring range is not just 60 seconds as in conventional chronographs, but 30 minutes. Technically, this was achieved by duplicating the construction of the chrono/rattrapante wheel pair. In other words, the minute-counter wheel has a through bore that accommodates the shaft of the second rattrapante wheel. Since the LANGE DOUBLE SPLIT contains a chronograph mechanism with a precisely jumping minute counter, the rattrapante minute counter jumps as well. A lever mechanism developed by Lange especially for this purpose assures that it advances by only one minute at a time, at precisely the right moment.

Reference lap time measurement: If a lap time measured with the rattrapante hands is required as a reference time for further measurements, it can simply be "stored". This is done by leaving the stopped rattrapante time untouched and by resetting the chrono sweep-seconds hand with the start/stop push piece followed by the zero-reset push piece – or instantaneously with the zero-reset push piece (flyback). The normal chronograph function can now be used to measure a reference lap time and compare it with the time displayed by the rattrapante hands. This process, too, can be repeated for any number of further reference lap times that might be needed.

Fastest/slowest lap measurement: Technology buffs will appreciate another function that allows the identification of minimum and maximum – the fastest or slowest lap of all laps measured, for instance. To determine the fastest lap of a series, the first lap is stopped with the pair of rattrapante hands, the second with the pair of chronograph hands. At this point, both times need to be compared.

If the lap time displayed by the chronograph hands is the shorter of the two, this value must be stored as the minimum, simply by pressing the rattrapante push piece twice in a row. The first actuation causes the rattrapante

hands to line up with the chronograph hands, the second actuation freezes them there. If the lap time indicated by the rattrapante hands is shorter, no action is required. The hands can stay where they are. The next lap can be timed—and if applicable, stored—by resetting, restarting, and restopping the chronograph hands.

Conversely, to determine the slowest lap, the rattrapante push piece must be pressed twice if the time measured by the chronograph hands is greater. In both cases, the value displayed by the rattrapante hands at the end of a series of measurements is the extreme (maximum or minimum) of all stopped times.

The disengagement mechanism mentioned above, a Lange proprietary development, prevents the so far technically unavoidable amplitude drop in conventional constructions when the chronograph hands are running but the rattrapante hands are stopped. Normally, the sustained contact between the still-running heart-shaped rattrapante cams and the rattrapante heart levers creates friction losses and torque fluctuations. In the LANGE DOUBLE SPLIT, these annoying phenomena have been eliminated because disengagement wheels on the rattrapante center wheel and on the rattrapante minute wheel separate both rattrapante heart levers from the still-rotating heart-shaped cams. This has a beneficial influence on the rate accuracy of the movement.

This makes the habitual use of the fascinating and very practical rattrapante function a delight that entails no regret, all the more as most of the complex mechanisms of this mechanical marvel can be admired through the sapphire-crystal caseback. It is A. Lange & Söhne's opinion that the LANGE DOUBLE SPLIT will push the emotions of connoisseurs around the world quite far up on the open-ended enthusiasm scale.

Data sheet LANGE DOUBLE SPLIT

Movement: Lange manufacture caliber L001.1, manually wound; crafted, assembled, and decorated almost entirely by hand to the highest Lange quality standards; precision adjusted in five positions; plates and bridges made of untreated cross-laminated German silver; balance cock engraved by hand.

Number of parts: 465

Jewels: 40

Screwed gold chatons: 4

Escapement: Lever escapement

Balance: New, shock-proofed Glucydur balance with eccentric poising weights; proprietary Nivarox I balance

spring with an attachment (balance spring clamp) for which a patent registration has been filed; frequency 21,600 semi-oscillations per hour; precision beat adjuster with whiplash spring.

Power reserve: 38 hours when fully wound

Functions: World's first flyback chronograph with double rattrapante, controlled by classic column wheels; precisely jumping chrono minute counter and rattrapante minute counter; flyback function; disengagement mechanism; hours, minutes, small seconds with stop seconds; power-reserve indicator; cumulative and lap-time measurements between 1/6th of a second and 30 minutes.

Operating elements: Crown for winding the watch and setting the time; two push pieces for operating the chronograph; one push piece for operating the rattrapante.

Case: Diameter 43 mm, platinum

Glass and caseback: Sapphire crystal (hardness 9)

Dials: Solid silver, two-tiered, black

Hands: Yellow gold, rhodiumed gold, red-lacquered gold, blued steel and rhodiumed steel

Straps: Hand-stitched crocodile straps with solid-platinum Lange prong buckle

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Part 44

Replacing a Broken Cable

After the article on various aspects of clock cable, I received several inquiries regarding various methods for making cable replacement simpler. Fortunately there are some procedures which help organize a course of action determined by the manufacturer of the movement.

The first and most user friendly is the Hermle movement. This is due to the fact that in all cases the drums are removable and the winding stops are easily set. In addition, the ratchets and clicks are external to the drum. It is an easy matter to release the click with a with a thin screwdriver or stout piece of pivot wire held in a vise and simply pull the cable down for removal.

To replace the cable by first removing the drums:

1. Wind all drums to the locking position regardless which cable is broken. This will establish the correct amount of cable to leave hanging later.

2. On the drum with the cable to be replaced, mark the positions of both stops where they align.

3. Remove the keeper holding the stop on the drum and remove the winding arbor.

4. Remove the drum and the cable from the drum.

5. Wind the new cable $3/4$ on the drum.

6. Replace the drum and arbor and wind to proper height.

7. Install winding stop such that the marks are again aligned. Note that the closest one can get in matching the height of the cable with the other two is $1/4$ turn on the winding arbor without removing the arbor and repositioning the drum by a few teeth.

Replacing the cable in most Urgos units require doing so with the drum in place as the drum and winding arbor are a single piece in the UW66 (see Figure 2) and UW32 series. Although the UW03 series does have

removable arbors depending on the date of manufacture, removing the drum itself without removing some external parts such as the strike assembly is not always possible. It is made more difficult by the fact that the clicks are internal and cannot be accessed directly. However, in all of these series, the click can be released via a notch on the click spring which protrudes slightly from a small opening (see Figures 2-5). With no tension on the cable, push the click spring in toward the arbor. This will release the click and the cable can then be pulled out to the end on the drum. The cable can then be replaced and carefully wind on the drum so that no overlap occurs. Note that the time drum is different from the strike and chime in that the time drum has a second maintaining power gear (see Figure 4). As a result, the click is accessed best with a tool that has a hook or "L" at the end to reach



Figure 1. Left probe made of pivot wire; right probe of soft steel.

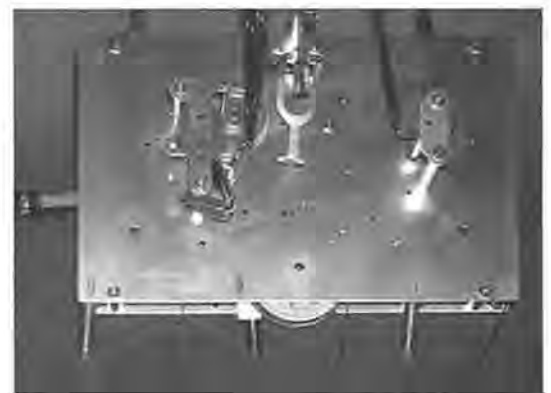


Figure 2. Urgos UW66 movement.

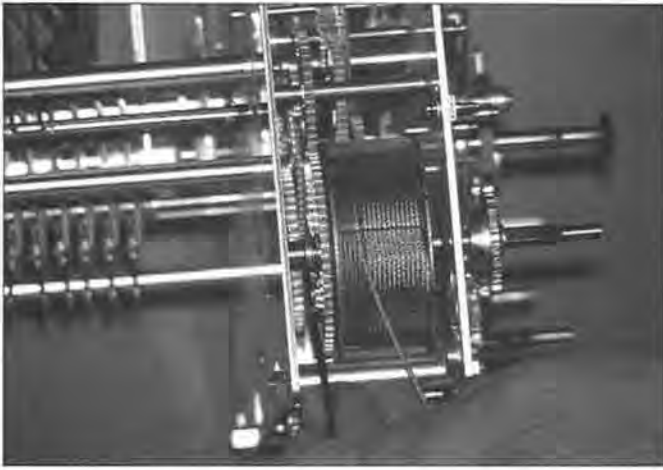


Figure 3. Releasing strike click spring using probe.



Figure 5: Pushing click spring toward center.



Figure 4. UW66 series time drum left and strike drum on right. Note click spring protruding from bottom semicircular cutout on both gears. Spring must be pushed toward center to release click.

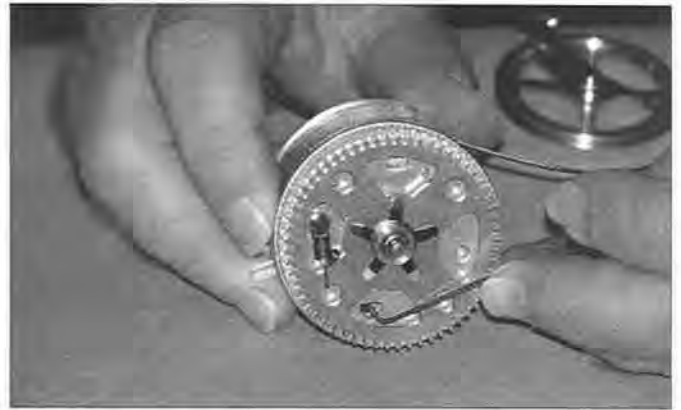


Figure 6: Click being released on time drum using "L" shaped probe to access inner gear.

inside the maintaining power gear (see Figure 1). Some types of pivot locating tools works very well for this. In some instances, the click is under a portion of the second wheel and the train may need to be activated to rotate the drum and expose the click spring.

In the Kieninger movement, the clicks are exposed and accessed directly. In some series such as the RWS, MS and MSU, the arbors are not removable but the clicks are external and have a click tail which can be pushed to release the ratchet (see Figure 7). In the KS and KSU series, although the arbors are fixed, the drum is held in place by removable bushings. As a result, one has two options for method of cable replacement as in the Hermle. In addition, the gears are crossed out so that the clicks can be accessed by an angled probe. Again, if one is not completely familiar with the winding stops, it is suggested that the cable be wound to the top and the stops marked as in the Hermle procedure if the drum is removed.

In all cases, although it might be possible to remove and replace the cable of a unit without removing the movement from the clock case, the extra frustration

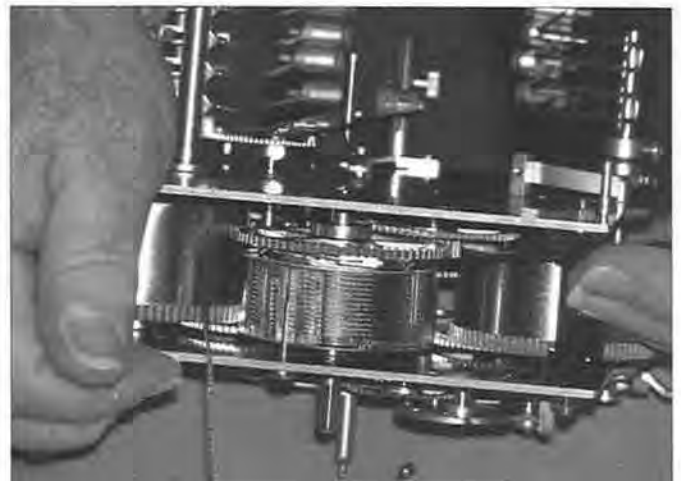


Figure 7: Releasing click on Kieninger unit by pushing in on click tail.

involved usually makes it inadvisable. Additionally, it is helpful to check the movement for cable fragments or any or sign of damage that may have occurred due to the cable breakage.

Final thought: "*Procrastination is opportunity's natural assassin.*"—Victor Kiam ☺



Dwight McCartney

An Introduction to Gemstones in Watches

The earliest watches were made in the 16th century and were a luxury available only to the very rich and royalty. Gemstones also were available only to the elite of society. The portable timepiece was soon recognized to be a form of personal adornment, and jewelers were enlisted to enhance the beauty of watches. As time passed, watches became very popular among the wealthy. When Jean Calvin moved to Geneva, his strict reformation did not allow the wearing of jewelry. The jewelers of the period were concerned that their livelihood would be lost. However, watches were considered a necessity, and so the relationship between the watchmaker and the jeweler was secured.

The union has continued through to today, with some of the very highest examples of watchmaking being made by jewelers.

Anyone who has been in watch repair awhile has encountered gemstones and possibly had some trouble with them. Whether a stone falls out in the ultrasonic, or a mineral dial has a hairline crack, the repairman can face a difficult situation if the customer is not aware of the problem.

When we take in a watch for repair, we examine the workings carefully to determine what work and parts the watch will need to put it into good order. This is also the time to inspect all of the gemstones in the watch to check for potential problems.

One of the most common problems in watch cases is loose stones. If a gem is loose in its setting, it has a high likelihood of falling out in the ultrasonic cleaner. If the loose stone is set close to other stones, they can rub together and chip. The customer should be made aware of this before doing any work, and the watch case can be given to a jeweler to tighten the stones.

A good way to check for loose stones is to use a tweezer and gently prod the stone on two or three sides, to see if it moves back and forth. A loupe will work for this, but a 10X or 30X binocular microscope makes it easier to see any movement of the stone, and not be fooled by reflections.

The condition of the mountings should be checked at this time. If there is significant wear on the metal holding the gem, then it should be built up to prevent the gem from being lost. The repair can be anything from a simple retipping of prongs, all the way to a complex reconstruction.

Stones which are broken can present a problem in the ultrasonic. They can loosen and fall out, or even fall apart. Any chips, fractures, or cleavages should be shown to the customer before working on the watch.

Treatments are enhancements that are sometimes applied to natural gemstones to make them appear better than they actually are. This can include oil in emerald, glass or other filling in diamonds, as well as heat treatments, irradiation, inks/dyes, or plastics in a variety of gems. Some treatments are quite stable and can take normal handling. Others are notoriously unstable and must be handled with great care. For example, the oil that is used in treating many emeralds to hide fractures and sometimes enhance color can be removed in an ultrasonic, heat, or solvent. Diamonds that have fracture filling or fancy color, irradiated or natural, should not be heated. And of course plastic treated gems should be handled like acrylic.

There are some gems which are so delicate that they deserve special care. While unlikely that these gems would be placed on a watch case, it is quite possible that they will be on or part of the dial. Opal, mother of pearl, labradorite, moonstone and malachite may be found on watches and should be handled with extreme care. These gems should not be placed in an ultrasonic, nor subjected to chemicals or heat. When disassembling a watch with a gemstone dial, extra care should be taken to examine for flaws. Stress should be avoided on a dial made of gem material.

Pave setting is a style of setting which places the gemstone flush with the surface, secured with raised metal beads to give the impression of a continuous, or "paved" gemstone surface. The style is popular on watch dials, cases and bands. But not all jewelers set the stones well. Some of the after market pave dials are poorly made. Before removing a pave dial, it may be prudent to gently check for loose stones, and get approval from the customer to have the jeweler secure them. This also should apply to hour markers with gems in them as well. When re-installing a pave dial, observe whether the gem protrudes from the back of the dial. One must avoid anything touching the back side, or pavilion, of the gem.

Occasionally, a watch will have the case made of natural mineral. These are usually a durable substance. Nevertheless they should not be subjected to heat, sudden temperature change or chemicals.

Although those may be called "rock watches," there is another kind of rock watch which was made in the 19th century. Waltham produced a very few pocket watches with clear rock crystal (quartz) bridge and balance cock. These days they are referred to as 'crystal plate' movements. The bearing jewels and their gold settings were set into the crystal, and they are truly an amazing combination of lapidary and horological arts.

More recently, Audemars Piguet has produced a similar wristwatch with rutilated quartz as

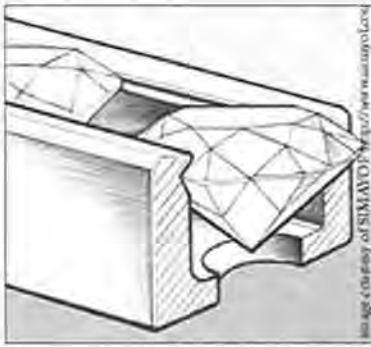


Figure 1. Channel set stones will be held in a channel. This is the most likely setting to have loose stones.

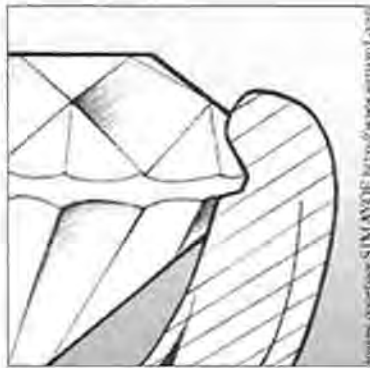


Figure 2. Prong set means the stone is held in place with prongs which can be part of the case, or a head which is attached to the case.

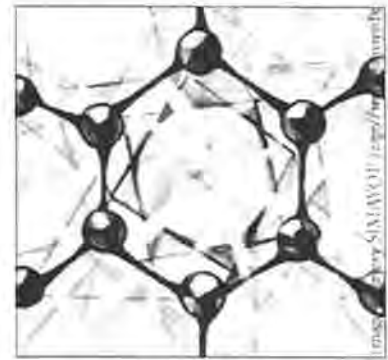


Figure 3. Pave settings are found on many dials and cases. Although the dial does not take wear, loose stones can be a problem. Also inspect the back of the dial for the pavilion of stones sticking out.

bridgework, both upper and lower. The watch has a tourbillon balance. The jewels are set into metal scroll bridges which are assembled to the quartz mainplate.

Regarding service on crystal plate watches, AWC member David Christianson writes, "Service procedures on these watches are the same as on regular movements, except that the crystal plate and balance cock should be handled with extreme care. These parts are quite fragile; they should be cleaned with soap and water (not ultrasonically or vibrasonically) and should not experience

any stress (prying, pushing or tapping) during disassembly or reassembly."

For service on the Audemars Piguet watch he states, "Here, again, ultrasonics should be avoided when cleaning this naturally grown quartz base plate. Unlike the Waltham, whose bridges are positioned last during assembly, the Audemars base plate is positioned first with the wheels and metal bridges positioned on top, so assembly is not nearly as sensitive as in the Waltham; but care and caution are still strongly advised."

Every gem should be carefully examined before being subjected to any procedures, and should be handled with tender loving care. The chart which accompanies this article will list many gems and some handling precautions. I have used a caution to indicate a gem which is usually stable, but that will sometimes have properties which require special care.

The ultrasonic cleaner and steamer should not be used for a stone that has fractures or unstable inclusions. Some gems will be sensitive to certain chemi-

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Some of the gems listed here may be rare in watches. Nevertheless I have included them since it is possible that they could be found in a timepiece.

GEMSTONE	ULTRASONIC	STEAMER	CHEMICALS	TOUGHNESS	NOTES
amber	no	no	no solvents or acids	poor	avoid abrasives or polishing
beryl other than emerald	caution	caution	caution in pickle	good	be wary of liquid inclusions or feather inclusions
chalcedony (agate, tigereye, rose quartz, etc.)	caution	caution	caution	good	possibly dyed, heat may change color
chrysoberyl	with caution	caution	good	good	
coral	no	no	attacked by acid	fair	will burn under torch
corundum	caution	caution	flux/borax will etch surface; oiled or dyed, avoid solvents	excellent	polish may enter surface fractures
diamond	ok	ok	ok	good	colored diamonds avoid heat; caution with fractured stones
emerald	no	no	avoid solvents and pickle	poor to good	avoid heat; avoid polish in fractures
feldspar (moonstone, labradorite)	no	no	poor, easy cleavage	avoid heat	
garnet	caution, no if liquid inclusions	caution	ok	fair	avoid thermal shock; tsavorite requires extra care
iolite	ok	ok	attacked by acids	fair	avoid heat
ivory	no	no	avoid solvents, chemicals, acids	fair	avoid heat, clean with cloth damp with methylated spirits
jade (nephrite, jadeite)	ok	ok	avoid acids, strong solvents	exceptional	avoid heat; possibly dyed or waxed
lapis lazuli	no	no	avoid solvents	fair	avoid heat; may be dyed or waxed
malachite	no	no	attacked by acids; avoid chemicals	poor	avoid heat
opal	no	no		poor, fair at best	avoid heat, thermal shock; dehydration may cause crazing
pearl, mother of pearl	no	no	attacked by acids	usually good	avoid heat; wash gently in warm soapy water
peridot	caution	no		fair	chips easily
quartz (amethyst, citrine, etc.)	caution	caution		good	may fade or change color with heat; avoid thermal shock
spinel	caution	caution		good	may fade under torch; may be brittle
sugilite	caution	caution		good	
topaz	caution	caution		poor	avoid heat, thermal shock; light blows may damage
tourmaline	caution	caution		fair	heavy inclusions, liquid inclusions require extra care
turquoise	no	no	avoid chemicals; polish compound will discolor	poor to good	avoid heat; ultrasonic solution may discolor
zircon	ok	ok		fair to poor	heat may change color; brittle, abrades easily
zoisite (tanzanite)	no	no		poor	brittle, abrades easily

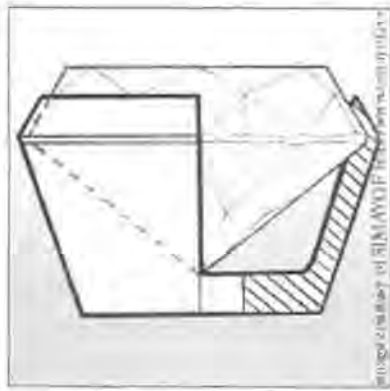


Figure 4. Bezel set is when the stone is held in place with a bezel which covers all or most of the edge or girdle of the stone.

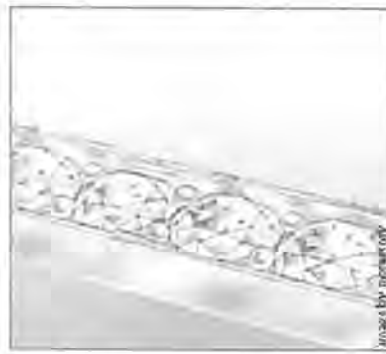


Figure 5. Bead setting is popular on many watches. When done properly, it is quite durable since the stones are set flush with the surface of the metal.

cals used in cleaning or pickling solutions. Toughness refers to the ability of a gem to resist fracture or breakage.

Some other considerations are included under notes. Thermal shock can occur when a gem is subjected to sudden temperature change. Examples of this would be rinsing a stone in cold water, then plunging it into boiling water, or holding the stone under the steamer, then rinsing in cold water.

While enamel is not strictly a gem, it is always delicate, and should be

handled with the utmost care. It should not be placed in the ultrasonic or subjected to thermal shock.

To learn more about gemstones and their history and properties, as well as gem setting, the Gemological Institute of America has a wealth of information available in books and classroom instruction.

Finally, whenever a fine gem watch is encountered, a moment should be taken to appreciate its beauty and the artistry that brought nature and craftsmanship together.

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Visual Needs of Watch and Clockmakers

Part 2

Dr. Joseph R. Panza, Optometrist

Introduction

This is the second part of a three part article discussing the visual needs of watch and clockmakers. The first part dealt with visual health and medical issues. This part will discuss and review critical aspects of the visual process. Part 3 will discuss ophthalmic optics, loupes, and miscellaneous issues.

Hopefully, this information will help target the individual needs at the workbench and in the general visual functioning process. I highly encourage routine professional vision care and hope this information will facilitate the dialogue between patient and doctor.

A few questions that I will address in this article are:

- 1.) What are some of the critical aspects of vision for watch and clockmakers?
- 2.) How are these visual processes defined and measured?
- 3.) Can I see better by correcting or recognizing these aspects of vision?

Critical Visual Function

There is more to quality vision than just 20/20. The process of vision function involves receiving, transmitting, and interpreting an electro-chemical signal in the brain. We literally see with the visual cortex of our brain. There are many variables that relate to the final outcome of precise quality vision.

For simplicity, I want to limit discussion to the following eight aspects of vision: accommodation, binocularly, contrast sensitivity, eye dominance, lighting, visual acuity, visual angle, and working distance.

Every watchmaker knows that a "running watch" does not necessarily mean that the customer is happy or that it is keeping time. One can rate a watch to specific quality aspects, just as eye doctors measure and attempt to get the best possible vision for their individual patients.

Accommodation and Working Distance

Accommodation is the process of focusing and releasing focus of the crystalline lens within the eye. This process changes with aging, and is the reason for bifocals or reading glasses usually beginning between ages of 40 to 45. The bifocal power is the replacement or compensation for focusing of age related loss of accommodation.

To properly prescribe a near lens, the doctor needs to know the individual's age, working distance, visual angle, and simulate the lighting that will be used at the work bench. If a loupe is used over an improperly prescribed reading or bifocal lens, then the outcome will be diminished.

Most eye doctors prescribe bifocals for use between 14 to 18 inches. It is critical to demonstrate your individual working distance for clock or watch work. Occupation reading or

bifocal lenses can be prescribed based on your demonstration of working needs. Most watch and clockmakers work between 4 to 14 inches and not their habitual everyday close distances.

Visual Angle and Posture

The angle and posture of the head and neck will directly effect extended comfort at the workbench. Ergonomics of the eye, hand, and neck are inter-related when work is close and detailed for long periods of time.

Demonstrate the angle you work to the prescribing doctor. I personally feel an angled work surface for certain types of watch repairs would alleviate some of the many stress related problems associated with continuous near work. A ten degree visual down angle is probably ideal for most watchmakers. Most workbenches are 38 to 40 inches high, which means the seat height is critical to maintain the same visual angle for individual variation in torso and height.

The height and type of chairs, stool, or sitting surface can drastically help compensate for the visual angle and posture of individuals. A backrest and seat cushion can also make a big difference in work comfort.

Light

Natural daylight is the ideal light for comfortable near vision. It provides equal and even light across the visible spectrum. Clock and

watchmakers can place their workbenches near windows to help with lens glare and more comfort.

Mixtures of incandescent and fluorescent light at the bench can balance out the deficiencies of each type of light. Off angle lighting will reduce shadows. Trial and error will help find the ideal distance and angle of near work lamps.

Fluorescent lamps come in cool white, warm white, and daylight. The daylight is the brightest and in my opinion gives the best overall results. A simple change in lamps may yield tremendous results.

Binocularity and Eye Dominance

Binocularity provides for the function of depth perception. This can be an important aspect of visual performance if the individual works with a binocular loupe. With monocular loupes, it usually is not a major issue.

Regardless of monocular versus binocular loupes, eye dominance

is very important to decide on which eye to use your loupe or how to set a binocular loupe.

A simple test with a hole in a card and the individual fixating at distance can determine which eye is dominated under binocular conditions. Eye dominance is the brain's preference for images arriving simultaneously from two eyes. Ask your eye doctor which is your dominant eye.

With age related vision deficiencies, it is sometimes important to cross over and use your loupe in the non dominant eye if the vision loss occurs in your favored eye. This may be difficult but essential since many times the decreased visual acuity of the once favored eye is lost. If you have vision loss with aging, ask the doctor to recommend which eye has the best visual acuity, contrast sensitivity and dominance to consider crossover vision rehabilitation for using a loupe.

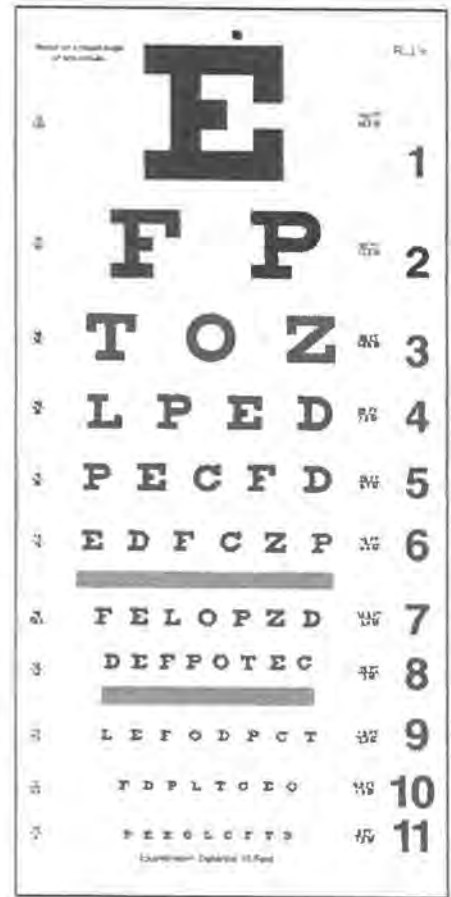


Figure 1. Distance Visual Acuity Test

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Figure 2. Near Visual Acuity Test

Visual Acuity

Visual acuity is the eye's ability to resolve detail. It is measured at both distance and near using designated optotypes. 20/20 is a fraction where the numerator 20 is the test distance and the denominator 20 is the visual angle of one minute arc to resolve separation of detail. The test distance of 20 feet is constant and the doctor sizes down the optotypes to find the most acute resolution. A 100 foot size letter is much larger and wider in arc than a 20 foot size letter. Therefore, a person with best vision of 20/100 does not have the sharp resolution of another with 20/20.

Visual acuity is highly variable from person to person. Each individual eye is measured separately at both distance and near. For watch and clockmakers, I suggest using lenses if possible and getting the visual acuity

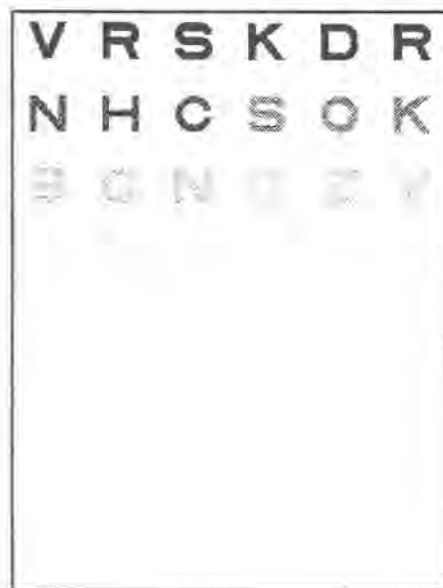


Figure 3. Note the letters are all the same size.

to the finest possible level 20/15 or 20/10. Also, ask the doctor which eye yields the best possible acuity. This may be helpful when deciding on which eye to place a loupe. When the dominate eye and best acuity eye are the same, this may give the best of all visual outcomes.

Visual acuity and contrast sensitivity are known to be affected by the aging process of the eye. Specialty ophthalmic lenses can help gain some losses related to visual acuity.

Contrast Sensitivity

Contrast sensitivity refers to the visual ability of finding dissimilar qualities in similar objects. This ability is equally important as visual acuity. As in visual acuity it is affected by age related changes in the media and retina of the eye.

An example, is when driving on a snow covered road, how one differentiates the edge of the road from the berm. Both surfaces are covered in white and look similar, but there are slight visual differences.

Sometimes, a person with age related vision change may have very good visual acuities but complain they cannot see. An individual with a beginning cataract and 20/25 vision may not be able to drive on a rainy night. They probably would fail a contrast sensitivity test.

There are test charts to evaluate contrast sensitivity. A simple test with one eye covered is to read the Snellen chart and then flash the seeing eye with white light and attempt to read the letters immediately.

Specialty ophthalmic lenses using yellow and amber tints can help individuals with problems involving contrast sensitivity. Ask your doctor to do a test for contrast sensitivity during your next routine eye exam.

Summary

Vision is the sum of many processes that result in a good outcome. This article reviewed several critical aspects of vision related to detailed close work. Consider more than just visual acuity when you notice a problem seeing. Hopefully this article has helped create an awareness of other possibilities that may be related to visual stress, loss or deficiency.

Part 3 will conclude with ophthalmic optics, loupes, and miscellaneous issues. Continue with your optometrist or ophthalmologist to find the best possible vision for your individual needs.



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As A Clockmaker Turns

The Clockmaker and His Lathe According to "Old Huck" Part 8

Introduction

This article involves tools and techniques of lathe work to refurbish and restore worn and scored pivots. The size range is that of older American clocks. The tools and methods may be easily modified for larger, or smaller clocks. The methods are the acme of simplicity.

Depending on your lathe features, all items shown may not be needed. The only requirement is that your lathe must have a tailstock, or some substitute for the tailstock.

This work speaks to the tools involved and does not explore the full scope of polishing materials. With reasonable care, you may expect excellent results.

This work is a process of turning between centers, with the two pivots running on their own axis: as such, this is classed as an exceptionally fine method of pivot work.

As the tools are constructed, only one collet size is needed; and, it may be of almost any mid-to-large size as used with the watchmakers lathe.

The Pivot Bed

The pivot bed is called a half-open center. It is really a cylindrical bearing of pivot-size with about 1/3 cut away to access the pivot. For mid-size and larger clocks, a

hardwood dowel is suitable. Smaller pivots are best worked in a bed made from brass.

Construction of the bed is simple, and only requires a few minutes. It can be saved for re-use. Turn your attention to Figure 85. A hardwood dowel is drilled a half-inch deep with a pivot-size drill bit. The bit is held in the fingers for this operation.

The surface of the bed is now ground away to expose about 1/3 of the pivot that is inserted in the end. Figure 86 shows that work and Figure 87 shows the pivot in place. Construction of the tailstock accessory was shown in Part 7 of this series. The accessory hole should be sized so that the pivot bed is a tight press fit into the hole. With about 1/3 of the pivot diameter exposed, it can be powered up safely. The cut away section must be of sufficient width to accommodate pivot files, burnishers or laps.

The Driver

An excellent driver method is illustrated in Figure 88, and following. This is a 1/8 inch diameter brass rod with two cup center sizes. A disc cut and finished from a wood dowel supports a drive pin, which is a tooth pick. A variety of holes in the disc are at various distance from the central axis. The drive pin is cut to length with pliers, or other means.



Figure 85. A finger held bit drills a 1/8 inch wood dowel to make a pivot polishing bed.



Figure 86. Grind away the dowel to make a "half-open" pivot bed.

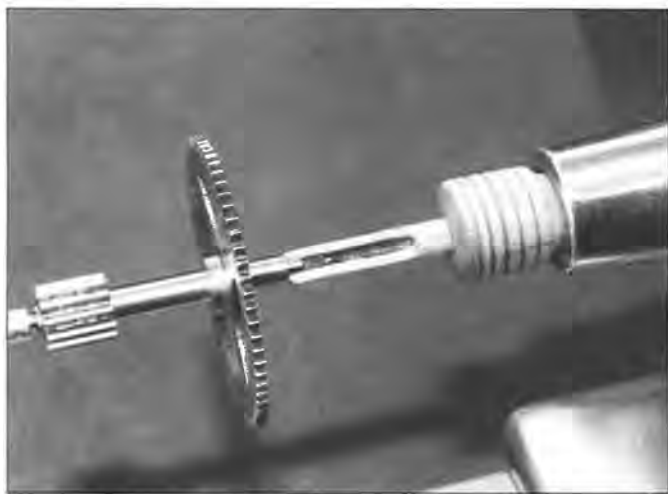


Figure 87. The perfect fixture to refurbish a clock pivot.



Figure 88. A brass rod with two cup centers, wood disc and toothpick—a perfect driver for pivot work.



Figure 89. The headstock driver of Figure 88 is ready to run.

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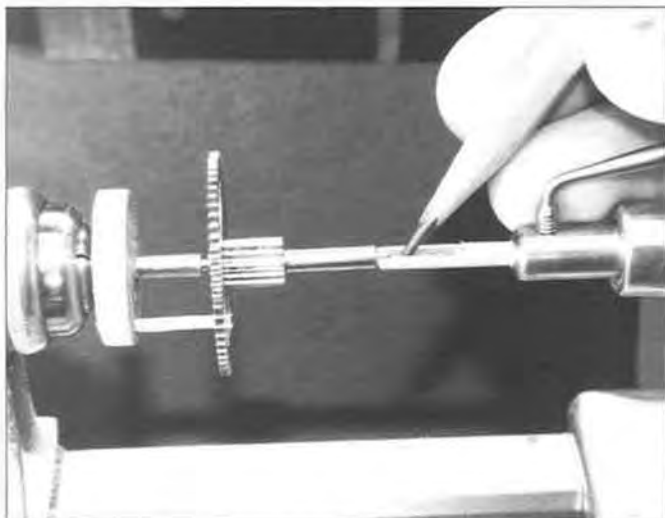


Figure 90. The pivot is "in a trap," yet open to be refurbished.



Figure 93. A flexible steel burnisher is used on this pivot.

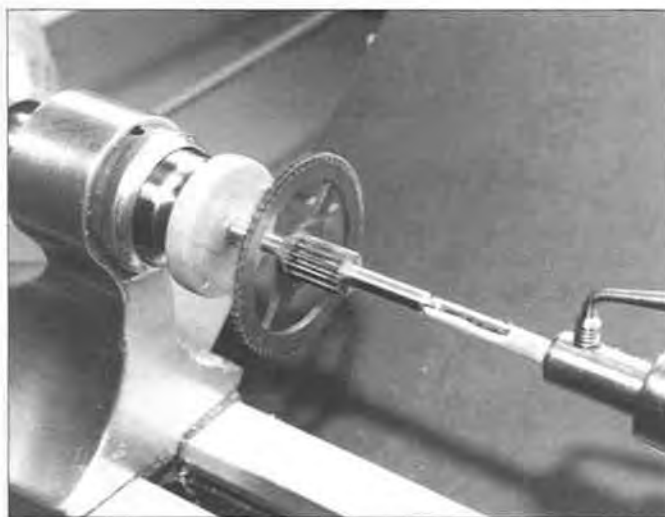


Figure 91. Shop-built driver and pivot bed. This bed fits into the tailstock runner.



Figure 94. Polishing material on a wood slip is used here.

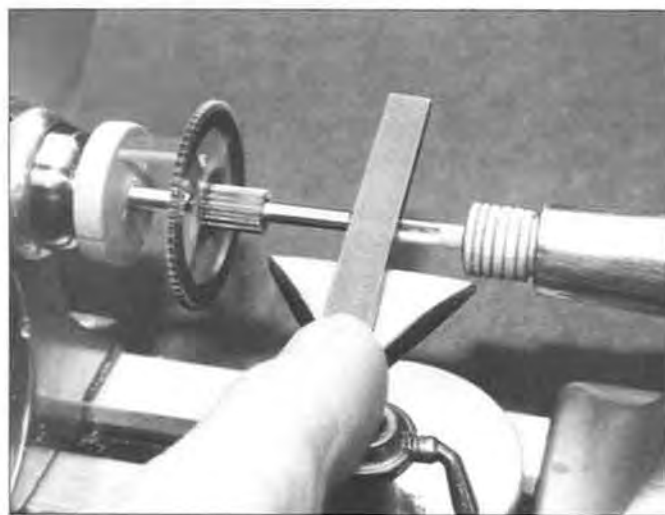


Figure 92. A #8 cut file with a "safe edge" is used, guided to the tool rest.

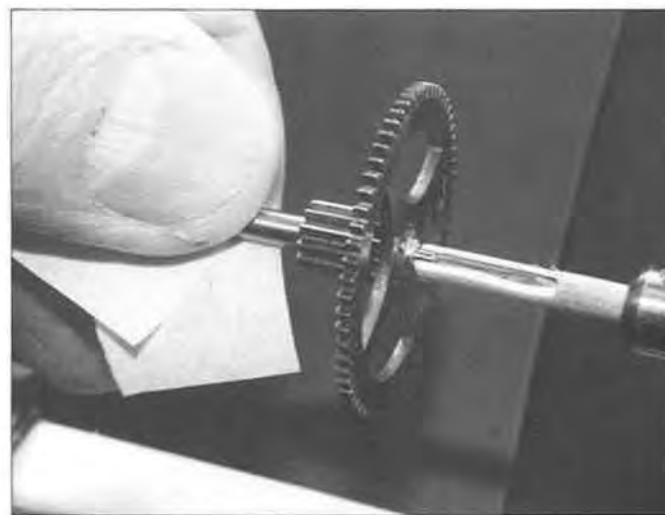


Figure 95. Pinch sticky sides together. Slit along the arbor to unwind.

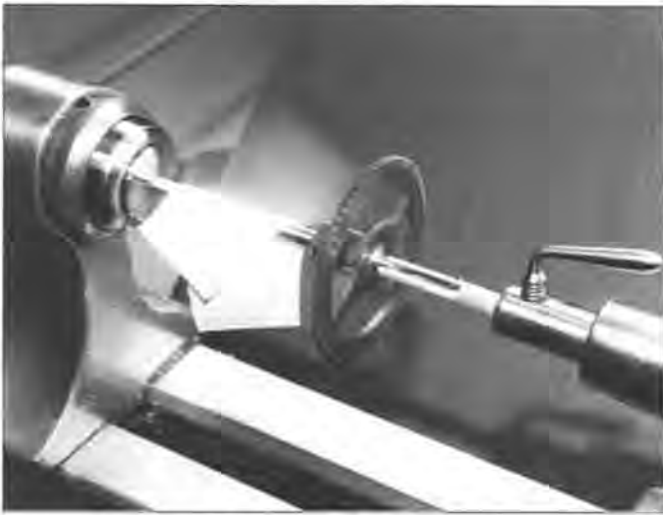


Figure 96. A longer arbor is coupled to a cup center with a fold of masking tape.

The view in Figure 89 is ready for use, and a functional set up is shown in Figure 90. In that view, the bed is in a tailstock runner. Some lathes have a collet-holding tailstock that may be used.

The pivot bed should be flooded with oil. When a pivot file is used, I support the bed lower side with a fingertip. When extensive work is done, clean the bed often to prevent a possible chip to scratch the work. That is more important for beds made of brass.

From the Figure 91 view, the bed semi-surrounds the pivot. It may be lifted out, and snapped back in place. Resilience of the wood permits in and out without re-adjusting the tailstock position.

When a pivot file is used, your lathe tool rest can be used to keep the file flat. The file must be kept in motion. When the file is held stationary, it fills with chips and ceases to function.

A flex steel burnisher is shown in Figure 93; that is a two hand operation. In some cases, you may elect to use a hardwood slip and a polishing material as the finishing operation, as in Figure 94.

This is an exercise where things seem to get easier every step of the way. Study Figures 95 and 96. Where the workpiece has sufficient arbor length, use a cup center in the collet with a half-inch or more overhang. Couple the pieces with masking tape. Pinch the tape in place with the flap overhang. To remove, cut along the arbor with a hobby knife, hold the flap and rotate the lathe knob.

Looking Ahead

The next, and last of this series will revisit some items on basic lathe set up. Those are to help you to achieve the greatest accuracy that your lathe can produce. However, all work in this 9-part series can be easily accomplished with a lathe of a modest degree of quality. My goal is to achieve excellence the easy way. ☺

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Rock Quarry

Who Wants To Smell Roses?

Watchmakers and clockmakers are judged by the smell of their shops. We're not talking about body odor from someone who hasn't bathed for five or six weeks. What we are talking about here are the odors from cleaning solutions, old rancid oil, heating things over an alcohol lamp or torch.

Speaking of old rancid oil, I kind of miss the smell when you open a watch that had some of the old oils used in it. I can remember years ago when the odor from some of those beauties would melt the fillings right out of your teeth. One time, a woman wanted to see the insides of her great grandfather's watch that hadn't been opened since the Civil War. After my eyesight cleared up enough, I handed it to her with a loupe. As soon as she put it close to her nose, her eyes rolled back into her head and she went down like a tree during a tornado. Fortunately, I grabbed the watch before she fell but I couldn't wash that smell off my hands for three days. It's a shame everybody is using synthetic lubricants now, they hardly have any smell at all. People wonder why you miss the good old days!

Have you ever made up your own cleaning solution? For years I made and used the old Daniel's solution. Best stuff around. One ingredient was the strong ammonia. We're talking about opening sinuses here. This isn't like the household ammonia. This strong ammonia would permeate the walls and turn your tools into a rusty heap if you accidentally spilled some near them. One thing about it though, the watches would be clean after running them through this concoction. You would have to have a very good exhaust system while using the solution. If not, it would take at least a day to get rid of the scent.

Some complain about the solutions you can buy today that contain ammonia. These are very mild. You can mix them with a

little soda water and have a nice cocktail.

There isn't as much cyanide used anymore. We used to keep large buckets of it to clean silver hollowware. This is another odor missed by many. It smelled similar to the stink bombs we made during chemistry class in school. Customers would have a funny look on their faces when they walked into the shop. One thing about it, after the odor got into your clothing, you could always get a seat at the local deli at lunch time.

Some of you younger people may not believe it, but we used to use gasoline as a cleaner. We never thought about how dangerous it was. I'll never forget, a fellow watchmaker and his wife had a shop in the next block. He used gasoline. One day his wife accidentally got near it with a cigarette. Needless to say, the explosion shook the whole neighborhood and blew them over the rooftops and into the next street. His wife was a real optimist. She was happy about the turn of events as it was the first time they had been out together in years.

Not all odors come from within the shop. Some customers bring them in. Some perfume and aftershave fragrances will tarnish the silver and cause the gold filled items to separate. No doubt it is used to hide some other undesirable smell. A little soap and water would do better.

It's a shame, but nowadays everything is too sterile. Walk into a store or shop and you get the smell of burning candles or deodorant spray. Not even a hint of naphtha or the crud burning out of a ring or other piece of jewelry. What is this world coming to? Pretty soon, people will do away with all the great smells and all we will have left to smell will be the roses or some other disgusting, offensive, repulsive odor.



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David Lannom, Springfield, TN, is looking for an instruction manual for a WaterWelder Torch.

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Jack Kurdzionak, CW

From the Workshop

You Are Invited

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

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

A Pivotal Question

Norm Schafer from Mesa, AZ, writes, "I managed to snap a balance staff pivot off in the hole of one of the punches while removing a taper shoulder staff from the hub of a 16 size Waltham balance wheel. The replacement staff was too long so I had to keep removing it from the wheel to shorten it until it fit the watch. So is there a way to clear the broken pivot out of the punch without ruining it? Do you know of a book or anything that addresses this type of question when an instructor is not available to look over the "new guy's" shoulder?"

The Answer

Norm, if you learn how to get those broken pivots out of the staking punches; please tell us because many watchmakers have the same problem. That being said, I have a

few suggestions. Although many use an older staking tool as you do, they use the cross-hole punch very sparingly as it is easy to break and can get a large pivot of a staff broken inside of it. In many cases there is another, sturdier punch in the set that can be used rather than these delicate ones.

When removing the staff from a Waltham watch, a taper mouth punch will often push the staff out of the balance hub and the hole in the punch is so large it will not break the pivot. What is hard to understand is why you have to shorten a Waltham staff? The originals and their generic substitutes supplied today will fit without any alteration in length. The only alteration that may have to be made on these is to turn the roller table seat to avoid splitting the roller when driving it on a staff that is too large for the roller. Anytime a Waltham friction staff appears to be too long, one should look for other problems such as incorrect balance jewels, a bent balance cock, or the lower balance jewel being fit to the cock and vice versa.

AWCI has several books for sale in its bookstore that can skillfully guide you. The best one for a beginner is Henry B. Fried's, *The Watch Repairer's Manual*. The next one to purchase is the *Bulova Training Manual*. They also sell Fried's more advanced books, which you will require as you progress with your watchmaking skills.

Bergeon of Switzerland's catalog does not show any cross-hole punches of the type you need to replace your damaged one. Just keep looking for replacements at NAWCC Marts. If any of our readers have suggestions to help you restore your damaged punch, they will be passed on to you.

Jack Kurdzionak

Cannon Pinions

One member wrote, "I am having a problem with adjusting the tension on the cannon pinion. It seems I have it too loose or too tight. I currently have two watches in my shop that I can't get the tension correct. Can you recommend something I can read and study that will help me with this problem?"

That's an easy question with a not so easy answer. Since the writer never stated which type or types of cannon pinions needed adjustment it is not possible to specifically address his question. But, there are some general procedures for adjusting cannon pinions that can be reviewed here. First, what is a cannon pinion and what is its function?

Originally, cannon pinions were hollow steel tubes with a small pinion machined into one end. (Somehow they resembled the barrel of a cannon to some early watchmaker, hence the name, cannon pinion) These tubes were friction-fit onto the center wheel arbor of a watch and turned at the same rate as the center wheel (1 RPH). The minute hand was pressed onto the upper end of the cannon pinion while the lower pinion pushed the wheels of the dial train so that the hour and minute hands would display the time. When the watch hands needed to be set, they could be moved independently without disturbing the time train because the cannon pinion would slip on the center arbor as the hands were moved and be tight enough not to slip while the watch was running so that the hands could display the correct time.

A loose cannon pinion would cause the watch display to constantly lose time and an overly tight cannon pinion would cause damage to the setting mechanism or time train when the watch was set to time. Adjusting the cannon pinion friction was, and still is, a necessity when repairing watches. Henry Fried's book, *The Watch Repairer's Manual* has many suggestions for adjusting cannon pinion friction. Cannon pinion problems prompted Mr. Fried to prepare and present a program for watchmakers called "Adjusting those Pesky Cannon Pinions".

All cannon pinions must be adjusted to have the proper friction. A skilled watchmaker can adjust most; while a few can only be done properly at the watch factory when the cannon pinion is manufactured. Bulova's Accutron 214 actually has two cannon pinions. One looks like a traditional cannon pinion but only serves to carry the minute hand and drive the dial train. It has no slipping function to allow the hands to be set. The center wheel has a non-adjustable friction device built into the wheel that provides the controlled friction needed to set the hands.

Cannon pinions are still with us, even in quartz watches, and they still cause problems. The ETA 955.112 utilizes a center wheel with a built in friction device. Normally this wheel causes very little trouble unless it loses its frictional grip and makes the hour and minute hands

lose time while the sweep second hand keeps accurate time. Sometimes this same center wheel seizes to make setting difficult and often causes the very small and delicate setting wheel to split in two.

If you need help with cannon pinion problems, the literature available from AWCI's bookstore or library is an excellent guide for the watchmaker who requires more understanding of those pesky cannon pinions, which will be with us for a long time.

Jack Kurdzionak

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An almost new, Omega caliber 1120 automatic calendar watch was brought to an AWCI member's shop for repair. The owner was concerned that its timekeeping was not as it should be. It was losing 40 seconds/day, which is unacceptable for this chronometer rated model. The watchmaker tested the watch on his 25-year-old timing machine and found the rate to be +5 sec/day. He wore the watch for a few days and the watch lost 40 sec/day just as it did on its owner's wrist. He again timed the watch on his machine and this time its rate was -30 sec/day. He demagnetized the movement and the rate stabilized at +5 sec/day as shown on the machine's paper tape. Again, he

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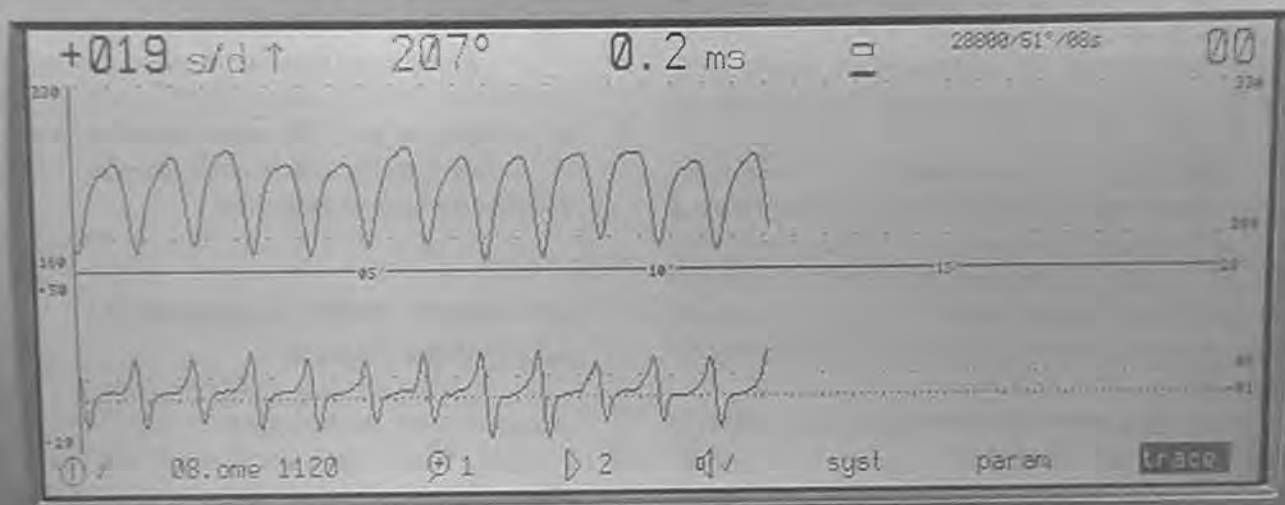
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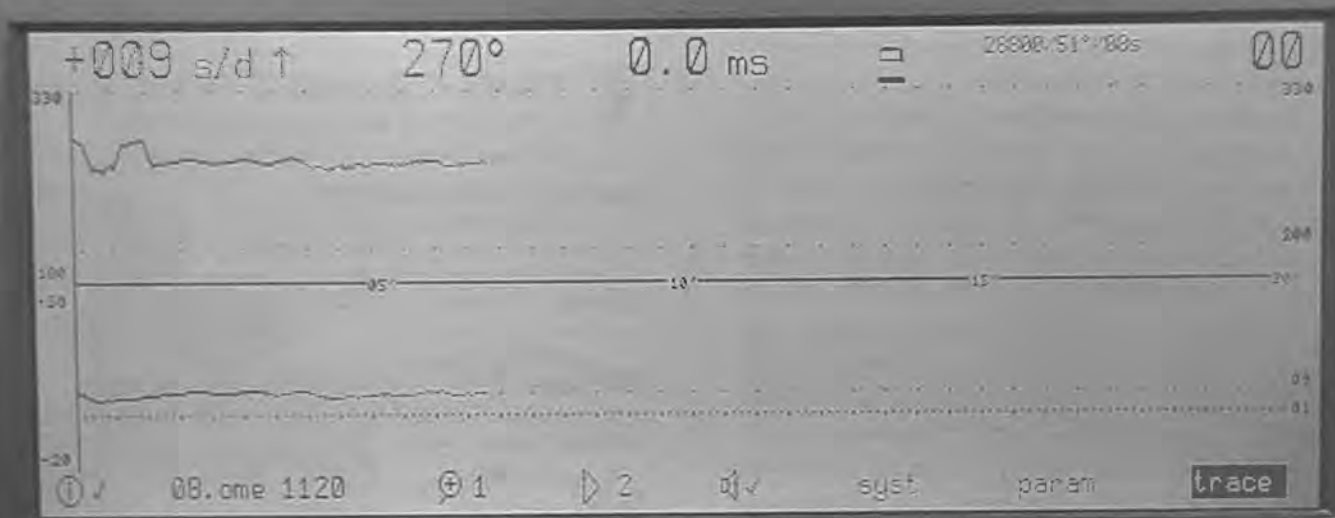
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Omega 1120 with a defective fourth wheel



Omega 1120 with new fourth wheel



wore the watch and again it lost time. He took the movement apart, cleaned it, and tested all end shakes and everything appeared OK. After assembly, he tested it on the timing machine several times at varying intervals to find that the rate was unstable and gave a different reading each time.

He was puzzled and took the watch to another watchmaker's shop for a second opinion. This shop's owner had recently purchased a new timing machine that had many more functions than simply measuring the

watch's timekeeping rate. One of the machine's functions could produce a simultaneous graphical display of the watch's amplitude and rate over a twenty-minute period. The watch was tested in the amplitude/time mode for twelve minutes as shown in the picture taken of the machine's display. The amplitude and rate were immediately displayed as a wavy line indicating an inconsistent rate and amplitude, rather than the desired straight line that would indicate constant amplitude and a consistent rate. An examination of the photo shows the amplitude

and rate varied in one-minute intervals during the test period. The second watchmaker quickly deduced that the trouble was probably fourth wheel related because that is the only wheel in the train that rotates once per minute. He removed the fourth wheel from the train. Visually it looked OK as it had to the first watchmaker, but he replaced it anyway with a new one from his stock. The watch was tested again and the machine now displayed a constant amplitude and rate as shown in the next photo. The fourth wheel was the problem, although it visually appeared to be satisfactory. Replacing it solved this problem.

Watchmakers who service modern watches need up-to-date equipment. It is not possible to accurately observe the amplitude on a 28,800-beat/hour movement equipped with a three or four arm balance wheel. Watchmakers servicing these watches need equipment designed with these 21st century products in mind. They can no longer depend upon equipment that was made for the needs of an earlier generation of watches and watchmakers.

Jack Kurdzionak



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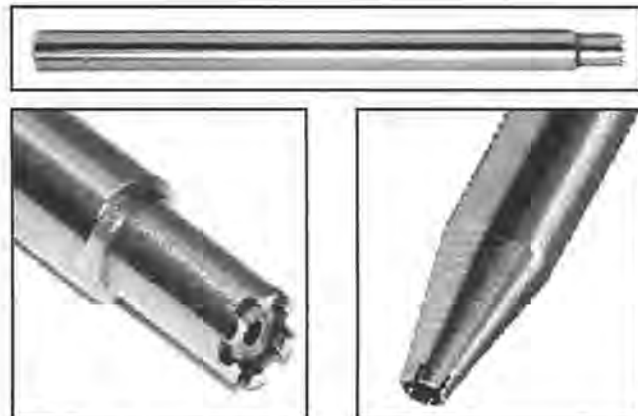
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Book Review

Robert D. Porter, CMW

The Modern Watchmakers Lathe And How To Use It, by Archie B. Perkins, CMW, FAWI, FNAWCC, FBHI. Published by the American Watchmakers-Clockmakers Institute, 701 Enterprise Drive, Harrison, Ohio 45030. Phone: 1-866-367-2924. ISBN Number 0-918845-23-8.

This 9" by 11¼" hard bound first edition has more than 400 pages with 548 illustrations. These illustrations include 267 photographs and 281 line drawings, all of which were made by Mr. Perkins. This book also contains eleven useful tables to supplement the text. An extensive index completes the work.

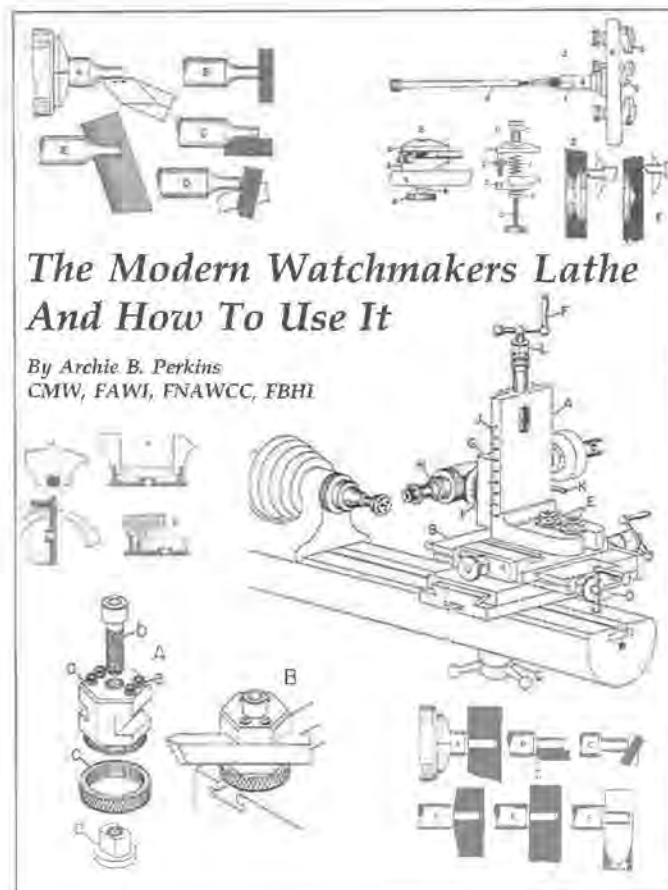
The 25 chapters in this instruction manual cover the most needed information on the watchmakers lathe to help students as well as journeyman watch and clockmakers to learn to use the small lathe and its many attachments safely and correctly. *The Modern Watchmakers Lathe And How To Use It* starts with basic turning operations and continues through to the most complicated operations, such as making several types of gears and the cutters to make them. Each chapter ends with a summary, references, and list of review questions.

Chapter 1

The first chapter begins with the history of the American Moseley Lathe in 1858, and also discusses several different lathe styles and how they are constructed. Useful information and specifications are given for eighteen makes and models of lathes including Bergeon, Boley, Clement, Derbyshire, Levin, Lorch, Moseley, Paulson, Peerless, and Webster-Whitcomb to name a few. The step-by-step disassembly, reassembly, and lubrication of the various components that make up the lathe headstock is illustrated and explained in detail.

Chapter 2

Chapter 2 illustrates the construction, and purpose, of several types of lathe tailstocks and attachments by such makers as Moseley, Levin, Derbyshire and Lorch, for example. The use of special purpose swing tailstocks manufactured by Webster-Whitcomb, and W. D. Clement is also discussed. Other tailstock attachments pictured include: The drill pad; 'V' center for drilling; tailstock chuck holder; the box tool for forming; supports for burnishing and polishing pivots, as well as the universal runner for repivoting.



Chapter 3

The proper use and care of split wire chucks is the topic covered in Chapter 3. A full page table of useful information—diameter, length, thread size, etc., for many different makes of chucks supplements the text.

Chapters 4, 5 & 6

Chapters 4, 5, and 6 include detailed information about the construction and use of wheel chucks, crown chucks, jewel chucks, sub chucks, lantern chucks, stepping devices and cement brasses. Special chucks such as grinding wheel chucks, the taper threaded chuck, true taper chucks, center chucks, face plates and driving dogs, balance chucks, three and four jaw chucks, bezel chucks, and the universal head. Each type of chuck and device is clearly pictured or illustrated.

Chapter 7

The hand rest and its attachments are the topic of discussion in Chapter 7. Many types of solid and tip-over T-rests are pictured, along with a selection of attachments for turning, sawing, filing, grinding—as well as supporting and polishing pivots.

Chapters 8 & 9

Chapters 8 and 9 focus on how the slide rest and its many attachments are used. Slide rests by the C. & E. Marshall Co., the American Watch Tool Co., the Moseley Co., and the Wolf-Jahn Company are pictured and described. The various parts of a three slide rest are shown in disassembly and the function of each part is described in detail. The use of a modified Wolf-Jahn slide rest to cut a watch fusee is pictured. The use of several types of grinding attachments to grind, drill, and polish various watch and clock parts is also depicted. Several types of gear cutting and milling attachments for the slide rest are shown, including a Wolf-Jahn milling attachment being used to mill a worm for a music box.

Chapter 10

Lathe maintenance and repair is the subject in Chapter

10. You are shown how to disassemble a lathe headstock; how to check the bearings; how to grind and lap worn housing and spindle bearings; how to make and replace a worn or broken chuck key in the spindle; how to lubricate and protect the lathe bearings; how to repair the hand rest; how to mount the lathe; and, how to make a new belt to drive the lathe.

Chapter 11

Chapter 11 is all about the stones, wheels, and laps used to sharpen steel and carbide gravers. All the basic graver shapes for turning nearly any type of part are shown. You are taught several methods to correctly sharpen both steel and carbide gravers.

Chapter 12

Chapter 12 begins with a comparison between the inch and metric systems of measurement. You are shown how to use a vernier caliper to take outside, inside, depth, and thickness measurements. The history of the micrometer is told, and the reader is taught how to read inch and metric micrometers. The use of the Levin metric depth micrometer, as well as an inch depth micrometer is also clearly presented.



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Watch & Clock Review is published 10 times per year and is the industry's most-used publication—the only one in North America devoted to watches and clocks. Get the one convenient source of industry news features including eight annual directory issues.

Chapter 13

Basic cuts used in making watch and clock parts on the lathe is the topic of discussion in Chapter 13: Chucking the work, presenting the graver to the work; how to make square shoulders; making the conical shoulder; turning centers; rounding; making a set of jewel pushers; making a center punch; and making a set of pivot drills. A table of dimensions for making the jewel pushers, and a set of pivot drills also supplement the text and drawings.

Chapter 14

Internal and external thread cutting is the subject covered in Chapter 14. Everything you would ever want to know about using screw plates, taps, tap drills, dies, and screw cutting attachments for the lathe is pictured, illustrated, and explained in this chapter. A Table of formulas and worked out examples, enhanced with close-up and other views of several thread cutting attachments for the watchmakers lathe, make this complicated subject much easier to understand.

Chapters 15, 16, & 17

Chapters 15, 16, and 17 cover the use of hand tools, grinders and laps to make and polish balance staffs or pallet arbors; and, making a winding stem with or without a sample. The tools and techniques needed to set several types of jewels is illustrated and explained.

Chapter 18

Chapter 18 is dedicated to the methods and means to be used to re-pivot arbors and pinions. The making of pivot drills is explained and illustrated as well.

Chapter 19

Chapter 19 describes the use of several types and makes of slide rests and tool post accessories. Also depicted are twenty-one different shapes of slide rest turning and boring tools; how cutting tools should be sharpened, and how they are used.

Chapter 20

Chapter 20 is all about making gear cutters, wheels and pinions. Several methods are presented to make fly cutters, single tooth and multi-tooth constant profile form-relieved cutters. A useful pantograph attachment to form the cutting edge profile of wheel and pinion cutters is also described and illustrated in this chapter. You are taught how to calculate the profile of wheel and pinion cutters as well.

Chapter 21

Several methods of indexing the lathe spindle to cut gears are described, pictured and illustrated in Chapter 21. Drawings are provided for making an index latch assembly to use with index plates. A simple method of making index plates is also illustrated. A very accurate universal

indexing mechanism using a worm wheel and worm is explained and pictured. Also included in this chapter are two full page tables for universal indexing using 40 to 1, and 80 to 1 ratios for cutting a range of gears from 2 to 400 teeth.

Chapter 22

Chapter 22 covers the mounting and making of wheel blanks; how to make wheel bushings; how to make ratchet wheels and the cutters to make them; how to make a square hole in a ratchet wheel blank, and how to cut the ratchet teeth.

Chapter 23

Making and mounting several types of pinions is illustrated and described in Chapter 23. Step-by-step instructions are given for turning the pinion blank, supporting the blank, cutting the teeth, hardening, tempering, making pivots, and polishing the pinion.

Chapter 24

Using the hack saw, and jewelers saw, is the subject covered in great detail in Chapter 24. Useful information about selecting the right blade for the job at hand; fitting the blade to the frame with just the right amount of tension on the blade; supporting the work; and, using the saw correctly is explained and illustrated. A table of approximate dimensions (size, teeth per inch, blade width and thickness) for twenty different saw blades supports the text and illustrations.

Chapter 25

Chapter 25 provides much useful information about many types of files, and how they are used to make replacement parts to repair clocks and watches. This chapter begins with file history, and continues with an explanation about how files are made and used. Other subjects include: File nomenclature; single and double cut files by Swiss and American makers; special hand files for filing different materials; needle and escapement files; fitting handles to files; holding the file and work for filing. Also pictured are several types of filing machines for the large and small lathe.

The Modern Watchmakers Lathe And How To Use It is, without a doubt, the most comprehensive book ever written about using the small lathe and its many attachments. Mr. Perkins has combined a lifetime of teaching and bench experience with his incredible drawings and excellent photography to produce a new reference work of the highest quality. Reading this book is the next best thing to being in the classroom or at the bench with the author, and is highly recommended for any watch or clock maker who wishes to use the small lathe to its fullest potential.





New Members

Alabama

Nguyen, Mike—Mobile, AL

California

Ferreira, Rodney—Vacaville, CA

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Salgado, Roquelina—Miami, FL

Sziklai, Jozsef—Hollywood, FL*

Sponsor: Jack Freedman—Brooklyn, NY

Georgia

Drulard, Ned—Marietta, GA

Illinois

Brackeen, Ernest W.—Riverside, IL

Fairbanks, Ken—Aurora, IL

Indiana

Retherford, Margaret—Kokomo, IN

Kentucky

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Grover, Ernest R.—Springvale, ME*

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Ferraro, Lance J.—Beaverton, OR

Pennsylvania

Brush, Richard B.—Pittsburgh, PA

Foust, Timothy S.—Spring Mills, PA

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Marler, Kenneth—Lebanon, TN*

Rieger, Joseph—Johnson City, TN*

Texas

Binh Hoang—Houston, TX

Lyons, Ken—Houston, TX

Wise, Justin T.—Addison, TX

Virginia

Arnold, Dick—Richmond, VA

Reynolds, Arvin—Lorton, VA

Canada

Clarke, Ces—Hamilton, Ontario

Myers, Roy—Pickering, Ontario*

O'Connell, C. J.—Red Deer, Alberta

International

Gower, Richard—Victoria, Australia

Koullapis, Justin—London, England

Robertson, John Jr.—Scotland

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

SUPPORT YOUR LOCAL AFFILIATE CHAPTER

**For information on forming a new chapter,
call 1-866-367-2924, ext. 304**



THE MAINE EVENT



The AWCI 2004 annual meeting and convention will be held at the Sheraton South Portland Hotel in South Portland, Maine from August 5-8, 2004. Bring the family on a vacation to Maine, while increasing your knowledge of horology. Premier horological

presenters include: James Moss from Littleton, Massachusetts; Richard Ketchen from Carlisle, Massachusetts; George Collord from Portland, Maine; Tamara Houk, from LaGrange, Illinois, and Richard and Linda Balzer from Freeport, Maine. Prices for the meeting and for trade show vendors will remain the same as last year. The hotel is adjacent to the Maine Mall (largest shopping center in New England). A free shuttle will take you two miles from the South Portland Airport to the hotel. Mark your calendars and plan to attend! Join us for this summer meeting at the shore. We'll see you for the "Maine Event."

Do we have a surprise for you! The Friday Night ELM Trust Dinner, also the same price as last year, will include a trolley car ride, a boat ride to House Island, a tour of a civil war fort, a display of, and presentation on, antique watches and clocks, AND a lobsterfest. It is time to get out of your trap and experience something new. This event is limited to the first 100 applicants and is being sponsored by Rolex so that your donation money will go to the Trust.

For hotel reservations call toll free 800-325-3535 and ask for the American Watchmakers-Clockmakers block of rooms at a rate of \$89.00 per night. The cost of an upgraded room is \$15.00 for a Starwood Preferred Guest room, and \$30 for a Club room. A Starwood room has bottled water, upgraded amenities, a robe and turndown chocolates. The club room includes the same features as the Preferred room does except it comes with a evening reception and complimentary breakfast. Sheraton South Portland Hotel is located at 363 Main Mall Road, South Portland, Maine 04106. Direct hotel telephone number is 207-775-6161. Fax 207-772-1267. Web Site: Sheraton.com/southportland

Deadline for hotel reservations is July 15, 2004. MAINE TOURIST INFO: 1-888-MAINE-11



AWCI 44th ANNUAL MEETING AGENDA

Thursday, August 5, 2004

- 9:00 a.m.-Noon Research & Education Council (REC)
- 9:00 p.m.-4:00 p.m. The Chronometer Club Technical Seminar
Tamara Houk, Owner and Manager of
Swiss Service Center in LaGrange, IL.
Six-hour seminar on repair, adjusting
and servicing of chronograph movements
(members & applicants only)
- Noon-1:30 p.m. Lunch on your own
- 4:00 p.m.-5:00 p.m. The Chronometer Club Business Meeting
(members & applicants only)
- 3:00 p.m.-6:00 p.m. Registration
Sheraton South Portland Hotel
- 6:30 p.m.-7:30 p.m. New Member Reception - hosted by
Membership Committee
- 7:30 p.m.-10:00 p.m. Welcome Reception
- 8:30 p.m.-10:00 p.m. Affiliate Chapter Orientation

Friday, August 6, 2004

- 8:00 a.m.-9:00 a.m. Registration
Sheraton South Portland Hotel
- 8:00 a.m.-Noon Affiliate Chapter Meeting
Keynote Speaker, TBA
- 10:00 a.m.-11:00 a.m. J.M. Dodson Perpetuation Fund
Meeting
- 11:00 a.m.-Noon Industry Advisory Board (IAB) Meeting
- Noon-1:30 p.m. Lunch on your own
- 1:30 p.m.-5:30 p.m. AWCI Board of Directors Meeting
- 6:15 p.m. Trolley car leaves for ELM-Trust Dinner
- 9:30 p.m. Trolley car returns to Hilton

Saturday, August 7, 2004

(Note: No Board Meeting on Saturday)

- 8:00 a.m.-9:00 a.m. Registration
- 8:00 a.m.-9:30 a.m. James Moss - *Cleaning Solutions* -
difference between repair, restoration
and conservation
George Collord III - *History of
Watchmaking in America*
Richard Ketchen - *Tools of the Trade,
Past and Present*
- 9:45 a.m.-11:15 a.m. Richard & Linda Balzer - *Life in the Towers
after Seth Thomas and Howard* (tower
clock restorations)
Tamara Houk - *Job Track - Computerizing
Your Shop*
- 10:00 a.m.-4:00 p.m. Trade Fair
- 11:30 a.m.-1:30 p.m. Luncheon Buffet
- 1:30 p.m.-3:00 p.m. George Collord III - *History of
Watchmaking in America*
Tour of Balzer Clockworks in Freeport
Tamara Houk - *Job Track - Computerizing
Your Shop*
- 3:15 p.m.-4:45 p.m. James Moss - *Cleaning Solutions* -
difference between repair, restoration
and conservation
Richard Ketchen - *Tools of the Trade,
Past and Present*
Tour of Balzer Clockworks in Freeport
- 6:00 p.m.-7:00 p.m. President's Reception
- 7:00 p.m.-9:30 p.m. Dinner Buffet & Awards Program

Sunday, August 8, 2004

- 8:00 a.m.-9:00 a.m. Breakfast Buffet
- 9:00 a.m.-Noon AWCI Board of Directors Meeting

AWCI's 44th Annual Meeting — August 5-8, 2004

Registration Deadline: July 14, 2004

(Please type or print all information requested)

Name: _____ AWCI Member No.: _____

Company/Affiliate Chapter: _____

City: _____ State/Province _____ Zip/Postal Code _____

Phone: _____ Fax: _____

E-mail: _____

Spouse's Name: _____ Guest's Name: _____

Child #1: _____ Age: _____

Child #2: _____ Age: _____

Child #3: _____ Age: _____

Registration Fees

Received by July 1

After July 1

Weekend Package*

AWCI Member _____ @ \$205.00 _____ @ \$255.00

Nonmember _____ @ \$255.00 _____ @ \$305.00

Spouse/Guest _____ @ \$100.00 _____ @ \$150.00

Children (under 12) _____ @ \$ 45.00 _____ @ \$ 95.00

Saturday Package**

AWCI Member _____ @ \$165.00 _____ @ \$215.00

Spouse/Guest _____ @ \$ 65.00 _____ @ \$115.00

Education Package***

AWCI Member _____ @ \$125.00 _____ @ \$175.00

I plan to attend the tour of Balzer Clockworks _____

(No charge. Limited to the first 20 responses.)

Friday Night ELM Trust Dinner _____ @ \$ 60.00

(Boat ride, fort tour and lobsterfest. Limited to the first 100 responses.)

Number of ELM Raffle ticket(s) _____ @ \$25.00 each _____

First prize, win a week at the Kurdzionak's cottage in the White Mountains; second prize, free convention registration; and third prize, one-year free AWCI Regular Membership [Void where prohibited by law. This raffle is being conducted according to the laws of the State of Ohio and proceeds go to the ELM-Trust.]

Total _____

Should we be aware of any personal health issues you have? _____

Do you prefer vegetarian meals? _____

***Weekend Package Includes:** Thursday: Round Table Reception; Friday: Continental Breakfast, Affiliates and Board Meetings; Saturday: Continental Breakfast, Technical Presentations, Luncheon, & Dinner/Awards Program; Sunday: Breakfast Buffet

****Saturday Package Includes:** Saturday: Continental Breakfast, Technical Presentations, Luncheon & Dinner/Awards Program

*****Education Package Includes:** Saturday: Continental Breakfast, Technical Presentations & Luncheon

Note: Program changes will be announced as they occur.

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Please make checks payable to AWCI. All fees must be paid in advance; credit cards will be processed upon receipt. Payment in U.S. Funds, drawn on a U.S. Financial Institution. No refunds for cancellations after July 15, 2004

AWCI's 44th Annual Meeting
701 Enterprise Drive Harrison, OH 45030
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AWCI'S 44TH ANNUAL MEETING

AUGUST 5-8, 2004

VENDOR REGISTRATION

DOOR PRIZE – ELM TRUST DONATION



The American Watchmakers-Clockmakers Institute would like to invite your participation in the AWCI 44th Annual Meeting & Convention at the Sheraton South Portland Hotel in South Portland, Maine. Exhibitors may reserve a table for \$225 for Saturday, August 7, 2004 from 10 a.m. to 4:00 p.m. This will also entitle two people to have lunch and dinner with the convention attendees. Deadline for vendor registration is July 1st, 2004.

Company Name _____
 Address _____
 City _____ State _____ Zip _____
 Phone _____ Fax _____
 E-Mail _____

Please reserve a table for us to exhibit during the AWCI 44th Annual Meeting. The following people will be attending:

Name _____ Title _____
 Name _____ Title _____
 Name _____ Title _____

A door prize will be sent to AWCI for the drawings held during the Trade Fair and at the close of the convention. This entitles our company to be listed as a convention sponsor.

The generous financial support of persons interested in preserving the past and building the future of horology augments the AWCI-ELM Charitable Trust. Your donation will contribute to the education of the next generation of watchmakers and clockmakers or to maintaining the historical record of the craft.

Please accept this donation of \$ _____ to the AWCI-ELM Charitable Trust

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AWCI'S 44th ANNUAL MEETING

Sponsors to date include:

- Rolex
- Merritt's Antiques
- S. LaRose
- Hermle Black Forest

Exhibitor:

- Witschi Electronics U.S.A., Inc.

Door prize donated by Hermle Black Forest. The drawing for door prizes will be held during the Vendor's Trade Fair luncheon.



AWCI-Educational, Library & Museum Charitable Trust Fundraising Raffle

WIN A 7 NIGHT STAY AT A YEAR-ROUND TWO-BEDROOM VACATION HOME IN THE BEAUTIFUL WHITE MOUNTAINS OF NEW HAMPSHIRE (AN APPROXIMATE VALUE OF \$1,250). ONLY 100 TICKETS WILL BE SOLD. \$25.00 PER TICKET.

RAFFLE OPEN TO CURRENT AWCI MEMBERS ONLY

LIMIT OF 4 RAFFLE CHANCES PER MEMBER

First Prize: One full week in a two-bedroom home in the White Mountains of New Hampshire.

Second Prize: Free meeting/conference registration, excluding transportation, hotel accommodations, and The Trust's Fundraising Dinner (an approximate value of \$250).

Third Prize: A One-Year AWCI Regular Membership (a \$74 value).



The AWCI-ELM Charitable Trust is pleased to announce that Jack Kurdzionak, the President of AWCI, and his wife Terry, the current membership chairman, are offering the use of their vacation home in New Hampshire for one week as a first place prize in the AWCI-ELM Charitable Trust's fundraising raffle. The home is located in the White Mountain town of Campton, NH, and is within easy driving distance to all White Mountain attractions. It is also a one-hour drive to Mt. Washington, the tallest peak in the Northeast, and a two-hour drive to the seaside city of Portland, Maine. The lucky winner can use the home immediately before or after the AWCI annual meeting, which will take place from Aug. 5-8, 2004, in South Portland, ME. Or, if the winner would like to use the home during the "leaf-peeper" season, or for a winter ski vacation, he/she may do so as long as prior arrangements are made with the Kurdzionaks.

The drawing will be held on July 1, 2004. The winning names for all three prizes will be selected by an individual who is not employed by, or affiliated with, AWCI or the AWCI-ELM Charitable Trust in any way. Winners will be notified via the telephone no later than July 3, 2004, by Gary Richards, the Director of Development, for the AWCI-ELM Charitable Trust.

Tickets can be purchased one of three ways. You can send a check (i.e., made out to the AWCI-ELM Charitable Trust) to the AWCI office with your AWCI convention registration form or by checking the box that is on your merchandise ordering form along with your credit card number or your attached check. You can also call the office directly and purchase tickets with your credit card. If you use this option, please call Heather Kyde at 1-866-367-2924, ext. 301, and she will process your transaction for you. We look forward to hearing from you and wish the best of luck to all of you who choose to participate in this exciting raffle.

VOID WHERE PROHIBITED BY LAW

THIS RAFFLE IS BEING CONDUCTED ACCORDING TO THE LAWS OF THE STATE OF OHIO



Glenn D. Gardner,
CMW

Affiliate Chapter Report

Fellow AWCI members:

Summer is almost here and it's time to seriously think about attending the annual meeting in South Portland, Maine. When my family was young we would make the family vacation revolve around AWCI meetings in the summer. Contact your local organization and offer to represent them as their affiliated chapter representative.

Last year about 22 groups were represented at the meeting and we should be able to add to that this year. I have been told by good sources Maine is the place to be in August. The program is great but most of all you get to meet and talk with horologists having the same problems you are having. I can honestly say there hasn't been a meeting where I have not greatly benefited from the knowledge that I gained. One of my fondest memories was socializing with Henry Fried. Wonderful memories like this can happen when you attend the AWCI meeting. Well, days like that happen when you are at the AWCI meeting. No I don't anticipate Henry returning like Elvis, but you never know. We have so much knowledge to learn and disperse. Yes, you might even give one of your tips to someone else and they might think that was worth the trip.

As members of an affiliated chapter or members at large you have a responsibility to vote for 3 members you feel will best represent you on the Board of Directors. Your vote counts and is heard by all members on the board. During the affiliated chapter meetings each chapter gives a report on their activities during the past year. They can also bring up motions for the AWCI Board of Directors to discuss. You ask how this is done? Well the affiliated chapter representatives discuss the issues and vote to make it a motion to the Board of Directors of AWCI. If it passes the motion is forwarded by the affiliated chapter chairman as if coming out of a committee. This is one of the ways you as a member can make a difference. If a member not affiliated with a chapter wants something brought up at the affiliated chapter meeting, please let me know. I will put it up for discussion. Contact me at ggardner@awi-net.org

In June Gene Bertram and I will be contacting each affiliated chapter to make sure we have everyone represented at the AWCI annual meeting. Be prepared to give us your representative's name. Everyone is welcome to attend the meeting but only affiliated chapter representatives can vote.



AWI-ELM TRUST BATTERY RECYCLING PROGRAM HAS BEEN DISCONTINUED

Due to all the non-silver oxide batteries that have become more prevalent and stricter regulations on how to dispose of these batteries, it was decided that the program should come to an end. The ELM Trust hopes that you will still think of them when recycling your batteries by requesting that your recycling company send your check directly to the ELM Trust. This will still be a tax deductible donation.

WATCHMAKERS/CLOCKMAKERS ASSOCIATION OF OHIO

58th ANNUAL MEETING & CONVENTION

JULY 23rd & 24th, 2004

in the heart of Ohio's Amish Country
at the

Carlisle Village Inn of Walnut Creek

4949 Walnut St, Walnut Creek, OH 44687
call 330-893-3636 for reservations

For information and registration contact
Mark A. Baker, P.O. Box 292, Damascus, OH 44619
(330) 537-3939 or e-mail bakerclock@voyager.net

AWCI Directors' E-mail Address Directory

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Jim Door: 1st Vice President	jdoor@awi-net.org
Alice Carpenter: Secretary	acarpenter@awi-net.org
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Glenn D. Gardner: Affiliate Chapter Director	ggardner@awi-net.org
Joseph Juaiere: REC Director	jjuaire@awi-net.org
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CLOCKS

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Gary Richards, Director of Development
AWCI-ELM Charitable Trust

AWCI-ELM Trust Update

News That Is Worth Your "Time"

Well, the year 2003 is now a distant memory and we are already five months into 2004. How TIME flies when you work around clocks, watches and other time related objects for a living. And speaking of time, it's now time for the AWCI-ELM Charitable Trust to begin its annual membership and fund-raising drive for 2004. Our membership/fund-raising program is called Friends of the AWCI-ELM Charitable Trust and it was started in the spring of last year. This membership recruitment/fund-raising effort is extremely important to our not-for-profit organization, as it helps us continue our efforts to:

1. Promote educational awareness about horology and the horological crafts.
2. Get the word out that we exist (both locally and nationally) and that we have top notch educational facilities to offer the public, as well as the unique History of Time Museum to show to the general public in the form of organized tours.
3. Improve the quality of, and the services provided by, our Henry B. Fried Resource Library.
4. Improve the quality of our existing marketing and promotion efforts by developing a new and desperately needed color brochure for our museum and library, maintaining our membership in the Greater Cincinnati Convention & Visitors Bureau, etc.
5. Provide our "friends" and other supporters with a quarterly newsletter.
6. Maintain the services of a full-time staff person to administer and oversee all of the above.

In 2003, the following individuals or organizations became members of our Friends of the AWCI-ELM Charitable Trust Program. They are listed in the order they came in for each giving level:

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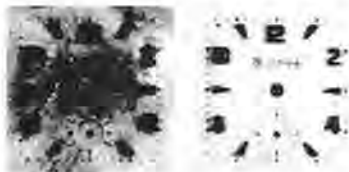
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