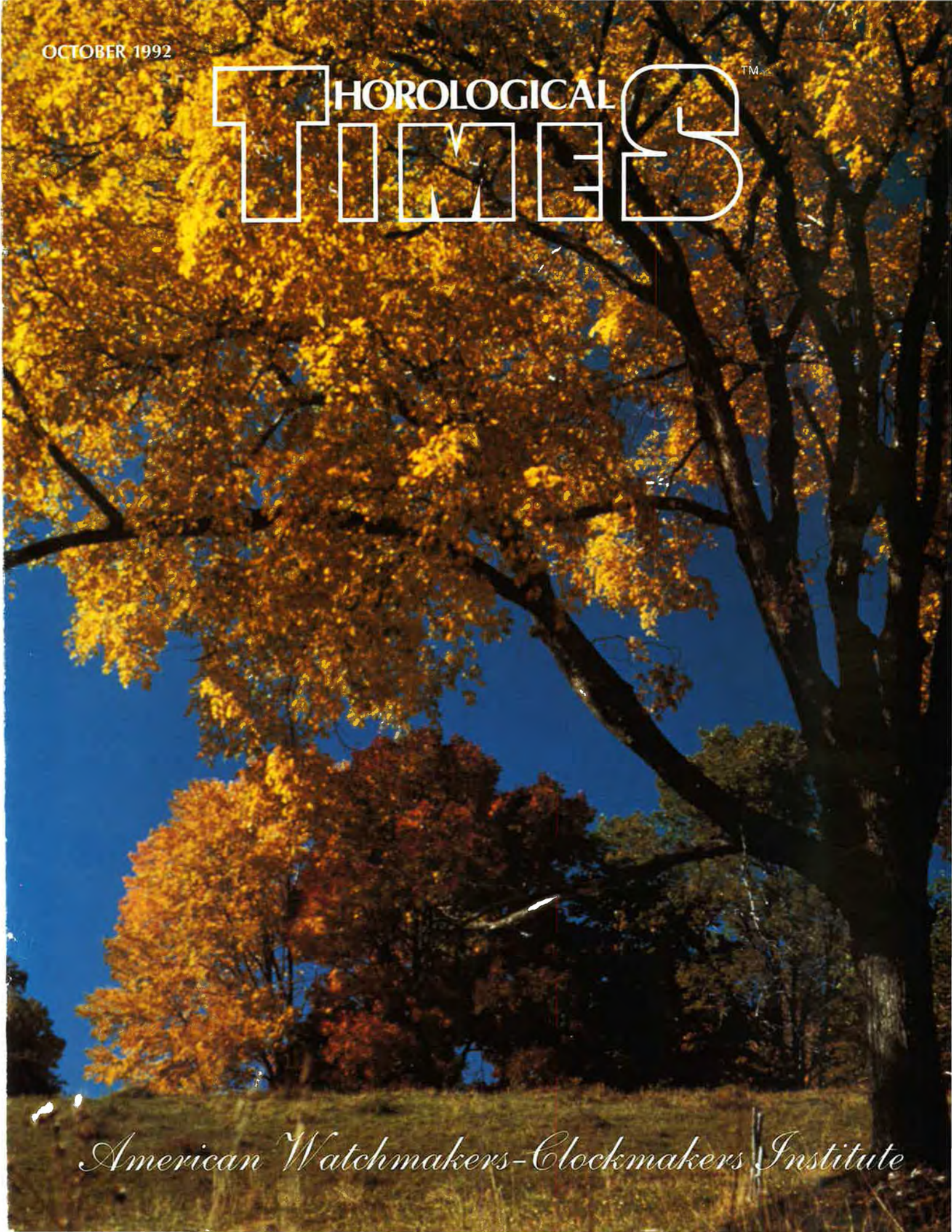


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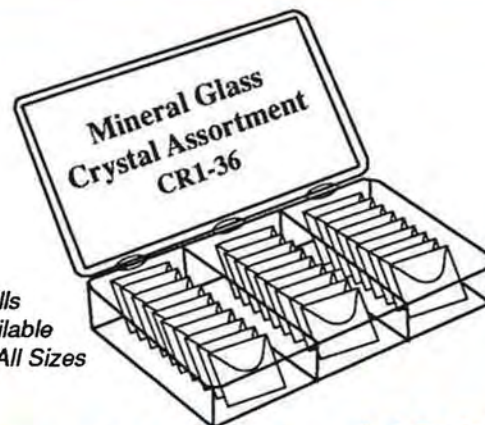


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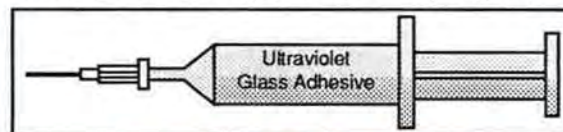
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HOROLOGICAL TIMES™



Official Publication of the American Watchmakers-Clockmakers Institute



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EXECUTIVE AND EDITORIAL OFFICES

AWI Central
P.O. Box 11011
3700 Harrison Avenue
Cincinnati, OH 45211
Telephone: (513) 661-3838
Fax: (513) 661-3131

Milton C. Stevens: *Editor*
Regina Stenger: *Associate Editor*
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President's Message

It's school time again all around our great country. Kids are getting all kinds of general education to prepare them for their future vocations. Are we doing our part to encourage some of these kids to consider our craft as their future profession? Probably not, but we should.

First, we must really believe in our business. Also, we must believe our business will make a good future vocation for others. Then and only then should we try to convince kids to pursue this as their chosen profession.

In our attempt to recruit we have competition. Yes, many other types of businesses are also interested in talking to these young school children, or at least when they reach high school age. These other businesses will make their pitch to entice some of the kids to enter their particular profession or business.

I have been told that the need for those with a scientific education is so great that leaders in the scientific field attempt to get kids to start early in life to take the appropriate courses.

We need to get in our share of requests for these students. In this regard we are probably lucky in our trade as we do not require that special subjects be studied (or majored in) as a requirement for our clockmaking or watchmaking trade. Of course, all subjects help, including computer courses which are becoming state-of-the-art in most all businesses, including ours.

We would like to talk to the kids at a young enough age so they would at least consider our trade along with the other trades, so maybe we have an equal chance. We also need to consider mature people as potential students of our trade. Most of these people will be making a career change if they decide to join us. Some of our new members do come to us from many different walks of life. Some were doctors, lawyers, farmers, etc. Maybe their first contact with us was through the NAWCC since their initial interest might have been collecting old watches and/or clocks or just reading about those who do. Recently a number of people who have experienced corporate "down-sizing" have opted to join our trade. Some of our new craftsmen come to us from the necessity to change jobs for reasons of injuries from a previous job. We are pleased to see that recently a number of young people are entering our field because they like to be independent and work with their hands.

We need all of the new people we can get, so let's do our part and put our foot in the door. We need to contact our public schools and talk to these potential craftsmen. We also need to talk to anyone we meet who may want to make a career change. AWI has literature and a career film that you can use for formal presentations. Good luck!

Wes Door

ON THE FRONT: This golden Autumn scene is by G. Don Fowler of Belmont, MA.

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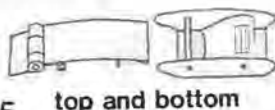
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Questions & Answers

Henry B. Fried, CMW, CMC, FAWI, FBHI, ★FNAWCC



A Lancashire Watch 1830-40

Q Several years ago I came into possession of an 18K antique hunters' case watch with a fusee movement. The crystal and hands were missing, and the watch probably needs other repairs; however, the watch does run.

I took it to the watch repair instructor at our local junior college. He advised me that this watch could be rare and suggested that I take photos of it and mail them to you for an evaluation.

On inspecting the watch, I noticed the photographer failed to shoot inside the back cover which has three symbols in the center side by side. The one in the center has an 18 with a crown above, the one to the left has a lion's head, and the one on the right looks like a letter or symbol encircled with a half moon (speculation).

Any information you could give me would be greatly appreciated.

Fletcher Merle Harkins
Ellisville, MS

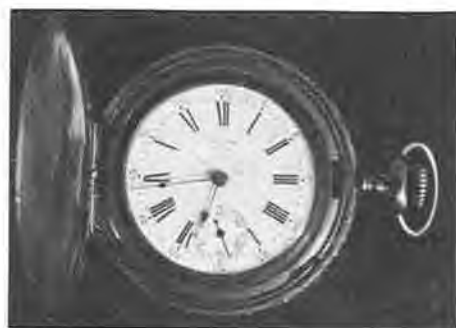
A Your watch is English of the 1830-40 period, made in Lancashire. The case does not seem original to the movement. The hallmarks in the inside back of the case are not English—at least not with the necessary marks for the city of hallmarking, and a date letter.

The three symbols, however, may be just what I'd like to examine. The "lion" is probably a leopard's head, denoting a date after 1823. The letter might be that date



Q I am enclosing photos of two watches that I would like information about. Any help would be appreciated.

Richard L. Sterne
Orem, UT



letter which would tell you when the watch (case) at least was made. A good sketch or photo of this showing the symbols could have told me more.

I don't believe the watch is unduly rare, since this one was made during the time when such watches were factory-produced. The maker is not listed among old-time makers.

(Please turn to page 6)

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QUESTIONS & ANSWERS

(Continued from page 4)



A Your watch as pictured and marked Alton was made by the New York Standard Watch Company. It went also under other names, one of which was Remington. These were also featured in an



early Sears-Roebuck catalog. The crown and ratchet wheel are phonies, serving only a cosmetic purpose. The real winding wheels are under the dial.

The second watch is a Swiss hunting gun metal case calendar watch, pin set, stem wind, circa 1890. It has the cylinder escapement. Many such watches were

produced using an extra dial plate upon which were fixed all the calendric indications and dial attached which could be fitted to many such movements, regardless of make or quality (mainly modest).

Q Can you give me some information about the watch pictured here? It is key wound in a silver case with the name "T. Stafford Exeter 107" on the plate next to the balance. It is chain driven, and has these three symbols in the case back:



Thanks for your help!

Cal Sustachek
Racine, WI



A The case has a Birmingham hallmark for the year 1813. The T. Stafford is probably a descendant of another who worked nearby in Bristol in the late 18th century.

Henry B. Fried.



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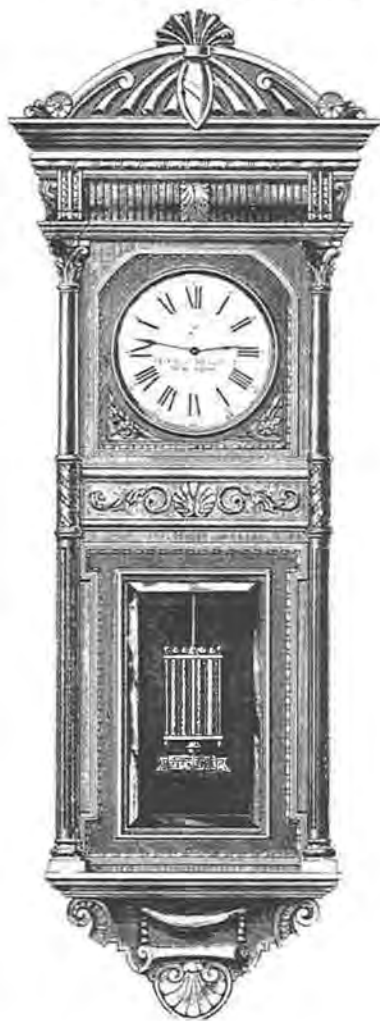
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Fred S. Burckhardt



A GUY WITH ALL THE ANSWERS

There are two types of people you should avoid—efficiency experts and consultants. Actually, they are similar in their duties but some prefer one title over the other.

An efficiency expert is someone who is an expert in the analysis and improvement of industrial efficiency and productivity. In other words, they are someone who couldn't hold a job or got laid off, so they gave themselves a title and became an expert overnight. Now this isn't to say that all experts and consultants don't know their business. Many have spent years in their particular fields and know what they are talking about. The ones I'm talking about are like the fellow I'm going to tell you about in this story.

At one time down at the butcher's shop, there was an apprentice butcher named Waldo. His expertise was slicing bacon. When people started to worry about their cholesterol they stopped eating so much bacon that business dropped off and Waldo was laid off.

Waldo had to decide about his future. His choices were to become a bartender, learn to drive an 18-wheeler, or become an efficiency expert. After much serious thought, he decided the latter would be more suitable. He went to school and studied almost two weeks before receiving his diploma.

One day Waldo came into my shop. I hardly knew him without his white apron. He was all dressed up in a business suit and carried a brand new briefcase. Even with this new outfit, the smell of fresh bacon permeated the air. He handed me his business card and said, "I'm here to revitalize your business."

I said, "Come on Waldo, you don't know anything about the watch and clock repair business. Besides, I have more work now than I can handle. So why should I want any more vitalization?"

His briefcase flew open and he pulled out a typewritten script from school and commenced to read. It would have been better if the words had all been one syllable. He reminded me of one of those jokers who call at meal time and try to sell something. A customer came in but Waldo kept reading the script. I guess he was afraid he would lose his place. While waiting, the customer helped Waldo with a few of the harder words. The customer left, glancing at Waldo on the way out.

When he finished, Waldo looked at me and said, "When do you want me to start?"

I said, "Waldo, I don't need and I can't afford anything like this."

He pulled out another sheet that was titled "Objections and Answers." He ran his finger across the page until he found the appropriate answer and read it off like a real pro. "It isn't a question of whether or not you can afford my services. The question is, can you afford *not* to take advantage of my services?"

I was starting to get a little fed up, but I thought about the poor guy just trying to make a living, so I asked Waldo what I had to do. He whipped out another sheet and told me I had to answer a few questions.

He asked, "How many hours a week do you work?" I answered, "Tuesday, Wednesday, and Thursday, 8:30 until 5:00, with an hour for lunch."

Then he asked, "Are you satisfied with your income?"

"Yes I am," I answered, "I make a very good living and I really don't care to work any harder."

Next was, "Don't you feel you should try to increase your business and hire some employees?" I said, "I just told you Waldo, I don't care to work any harder and I don't have to worry about anybody else, just myself."

After some more questions, Waldo started to see the light. He said, "At the present time I don't see you having any need for my services. Perhaps I will get in touch with you later on. Remember, if you run into any problems, I'll be here to help."

When he got ready to leave I asked if I owed him something for his service. He said he usually charged \$200 an hour, but since I was his first client he would only charge \$5.00 so he could buy lunch.

As he was leaving, he turned and said, "By the way, I'm thinking about going into the insurance business. Do you have any need for some insurance?"

I answered, "No, Waldo. Why don't you find some kind of work you would enjoy doing and where you can make yourself a good living?"

"Okay," said Waldo, "How about teaching me how to fix watches?"

□

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TO TEST OR NOT TO TEST? THAT IS THE QUESTION

BY JOHN KURDZIONAK

"Will my watch still be water resistant?" Today's watchmaker is probably asked this question more often today than any time in the past. The question arises very often when the watchmaker is asked to perform almost any repair to a water-resistant watch, including the routine changing of cells. The customer's concern is legitimate, and this article might help you to answer those concerns.

The points to be examined in this article concern the important features of each testing method including speed of testing, ease of operation, and interpretation of test results.

The dry water-resistance testers operate by placing the watch into an airtight chamber and pumping compressed air into the chamber around the watch. If the watch does not leak, the crystal will deflect toward the dial and remain deflected. If the watch leaks air, the deflection in the crystal will be temporary.

The wet tester works by suspending the watch above water in an airtight chamber. The airspace above the water is filled with compressed air. After remaining in the compressed air for several minutes, the suspended watch is immersed in the water below and the compressed air above is released. If the watch leaked, the compressed air will have filled the watch. When immersed, that air will then leak out of the case when the pressure above the water is released. If the watch is water resistant, no air bubbles will escape.

From the above, it should be obvious that the dry testers are more convenient to operate because the watch and strap both can be put into the tester. They are also faster because there is no cleanup after each use.

Both wet and dry testers will indicate the water resistance of a watch case; but, in addition, the wet tester will indicate the actual place on the watch case where the leak occurs. Properly performed, both wet and dry water-resistance testing does no harm to either the case or the movement of the watch.

Recently after leaving a guild meeting where testers was the subject, I weighed the pros and cons of purchasing water-resistance testing equipment for my shop. There are legitimate arguments on both sides of this issue--*to test or not to test*.

One side says to test because a large portion of the watches being produced today are water resistant. Many owners of watches ask if their watches will still be water

resistant after I have serviced them. Many wear their watches while swimming, scuba diving, showering, and bathing. These same owners would rather wear their expensive water-resistant watches while swimming, showering, etc. than risk having that watch lost or stolen while it is not in their possession. Some customers even appeal to the watchmaker's ego by asking why the watchmaker cannot restore the water resistance of the watch after the cell has been replaced, especially since the clerk at the local pharmacy changed the cell two years ago for half the price the watchmaker charges and the watch did not leak.

Finally, there might be some new sources of profit in water-resistance testing. It is a hard-to-find service which customers expect to pay for. If the watch passes the water-resistance test, the customer can be assured that the watch is water resistant on the day the test is performed. If the watch does not pass the test, the watchmaker has an opportunity to perform additional services to the watch to make it water resistant again. There is nothing inherently wrong with earning more because you are able to do more and sell more material.

The side against water-resistance testing also has a few legitimate arguments. The expense of purchasing equipment to test a watch for water resistance cannot be justified if the watchmaker does not have the necessary volume of work or type of work to warrant such a large purchase. Examples might include watchmakers who specialize in repairing antique pocket watches or vintage wristwatches. It probably is not too wise to put a vintage water-resistant watch anywhere near water. Other watchmakers who only service a small number of watches probably could not justify the expense. Another reason for not testing watches for water resistance is liability. If the watch does not leak today, does the watchmaker assume any liability for it not leaking in the future? If he does assume that liability, how far into the future does his responsibility go? Customer misuse of the watch can also become a factor in this argument. As an example, the watchmaker tests a Rolex for water resistance to a depth of 165 feet, and it passes the test. The owner of the watch then takes a swim in the local pool while wearing the watch and it fills with water because he, the owner, neglected to tighten the screw-down crown when he set the time on the watch. It would take Solomon to make both sides happy in this case.

While examining both sides of the question, I asked others for their opinion and received thoughts on both sides of the issue. I also received an offer from another watchmaker to use his wet type water-resistance tester in my shop. I did and was more than pleased with the results. Leaks were pinpointed and could usually be stopped by replacing crystals, crowns, gaskets, and o-rings.

I had to return the borrowed tester and soon I purchased one similar to the borrowed one. Now every customer who inquires about the water resistance of his watch after it has been serviced, even if only the cell has been changed, is told about the availability of water-resistance testing. Many people choose not to have the watch water-tested and take their chances when putting the watch under water. Others choose to not only have the watch tested, but restored to its original quality of water resistance by having all new sealing parts installed to insure its water resistance.

I also questioned an attorney as to his opinion about liability for water damages after a watch has been tested. His opinion was that the customer should be informed that the water-resistance test is only a test and not any sort of guarantee that the watch will remain water resistant in the future. Any certificate of water resistance given to the customer should state that the watch was water resistant at the time it was tested and that the watchmaker cannot be liable for any future damage to the watch, because he has no control over the circumstances of its use.

Being able to offer water-resistance testing may relieve the watchmaker of potential liability for water damage. If a customer declines testing and repairing of a water-resistant case, he is assuming the responsibility for that watch. If the watch is tested and repaired as necessary to make it water resistant, it probably will not leak unless it is damaged or misused.

Watchmakers have been held responsible for water damage to watches they have serviced because the owner contended that the watch did not leak before the watch was serviced or that the watch had received extensive service from the expert (watchmaker), and it leaked.

If you test a watch you can be paid for that service. If the case must be repaired to make it water resistant, you can be paid for the parts and labor to do so. Testing a watch *today* means it does not leak *today*; it is not a guarantee for the future.

If you do not test the watch, it means you are gambling that your customer will test the watch himself in a bathtub or swimming pool. If he does test the watch and it leaks water, you can expect a confrontation with an angry customer which you may well lose. Your customer has every right to expect that the watch you serviced is as good as new, especially if he is not otherwise informed about the limitations of water resistance. Of course, you will not be paid to repair the rusty watch your customer tested for you.

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BULLETIN BOARD

A. NEW REQUESTS

DUTCH "NOTARY" STAARTKLOK

Eugene Kramer, Mineral Wells, TX, has the following request:

I own a Dutch "Notary" Staartklok which I have identified as such through books from the NAWCC and AWI Libraries.

The books are fine for identification purposes, but are lacking in technical assistance. My problem is with the striking mechanism. There appears to be no warning cycle on this clock. At a few minutes before the hour the front lifting lever is pushed up by the pin. This also raises the strike lever which releases the warning pin and the striking starts prematurely because there is nothing to stop the warning pin. The strike lever would stop it but cannot go down because the front lifting lever is still on top of the pin. Thus the clock continues striking until run down, unless I move the minute hand to make the front lever fall off the pin, then the strike lever falls and stops the warning pin.

Never having encountered such a mechanism before, I am hoping you can give me some information on how this strike train should work. Also, what size weight and chain should be used for this type of clock?

SCHAUBLIN LATHE, MODEL 70

Gerhard Hutter, AWI Director from Palm Beach, FL, has contributed to the Education Center of Project Extend a Schaublin Model 70 lathe with head stock, tail stock, slide rest, driver pulleys, and 3/32 and 3/16 collets.

To make this lathe fully operational, we seek sources for additional collets and a milling attachment. The collets measure 12mm. Any information about possible sources for these items will greatly advance our ability to provide the advanced training classes presently planned for Project Extend.

HOROLOGICAL HORRORS IN WATCH REPAIR

Ron DeCorte, one of AWI's newest instructors, is putting together a class on "Pocket Watch Restoration". This will be an advanced course in which students will learn to make small parts, discuss and diagnose problems in watches brought by students, and master specific restoration skills. He would also like to point out specific "Horological Horrors" (examples of poor workmanship) provided by "Bulletin Board" readers.

If you have an example of a pocket watch "horror" that you can loan or donate to the class, it will benefit those taking the class. We are also planning an Introduction/Intermediate course on pocket watches.

B. RESPONSES

LA CLOUCHE WATCHES

Norm Glatt, Baltimore, MD, and Skee Jenssen, Fairfax, VA, responded to Marc Young's request for information about these watches which he described as looking like a "fossil" watch. Correct spelling is "La Cloche". It is a house brand watch for W. Bell Co., a catalog house. It is not clear whether W. Bell Co. still exists. If they do, we would like contact please.

JURA WATCH

Norm Glatt, Baltimore, MD, also responded to J.J. Figueroa's request for information on a 1-jewel "Tarleton" pin lever watch. The watch is identified by Norm Glatt as a Ronda 1317.21.

AKITA, LTD. FOSSIL WATCH

Stan McMahan, Greenville, SC, responded to Bill Young's request for information on a watch marked "Akita, Ltd." 9ME00 which appears to be a Fossil Watch. McMahan advises that this is an Orient calibre which can be found at Song's Trading & Supply Co., Los Angeles, CA, (800) 441-1042. The watch can be repaired by:

Fossil, Inc.
11052 Grader Street
Dallas, TX 75238
Phone (214) 348-7400
Fax (214) 348-1366

R. LA PANOUSE WATCH (SWISS)

Again Norm Glatt comes to the rescue by responding to William Haggard's request for a schematic for a man's 3-jewel calibre GK-260. While he has no schematic, Mr. Glatt advises that R. Lapanouse (one word) is an old Swiss firm which generally made watches with 2 jewels. At this point we do not know if this firm still exists. If anyone can provide details, we will be grateful.

C. ITEMS STILL NEEDED

PORCELAIN REPAIRS, DIALS & CLOCK CASES

From time to time, AWI receives requests from individuals who seek to have a porcelain watch dial repaired or duplicated; others seek to have a porcelain clock case repaired. A recent request comes from Kurt Nielson, Cape Coral, FL. We are aware of individuals who do this work for their own shops but do not accept outside work. We also know of several in England who do accept work from other shops. If anyone does this kind of work in this country for the trade, we would like to know about it.

SCHEMATIC FOR

C&E MARSHALL CLEANING MACHINE

Bob McGlothlin, Stuart, FL, has an ultrasonic cleaning machine, 400 watts, #4184, marketed by C & E Marshall Company. He is seeking a schematic for this machine.

BADEN JACQUES CLOCK

Rick Dunnuck, Julian, NC, has a two-melody tall clock marked Baden Jacques on the back plate. The plate is also marked Reg. U.S. Patent Office. No other patent information, such as date or number, is given. Mr. Dunnuck seeks the actual patent date.

SCHEMATIC & MANUAL

FOR ZENITH WATCH CLEANER

Brian Cavanaugh, Chichester, NH, needs an owner's manual and schematic for a Zenith Ultrasonic Watch Cleaning Machine. It has two small tanks; the serial number is #644.

J.R. BROWN & SHARP TOWER CLOCK

Bent Blondal, Newport, RI, seeks information on a tower clock identified as J.R. Brown & Sharp #3.

Do you have information regarding this month's requests? Do you need information about one of this month's responses? If so, send a self-addressed, stamped business-size envelope and your request to: "Bulletin Board," c/o AWI Central, 3700 Harrison Avenue, Cincinnati, OH 45211. □

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QUARTER STRIKER WITH REPEAT BY LUKAVETZKI

PART I

INTRODUCTION

This is the first in a series in which we will discuss the construction, operation, and service of a variety of approaches to accomplish the operations described in the title of the series. Included will be antique and semi-antique clocks including a carriage clock with repeat, petite/grande sonnerie, and alarm; a complicated 12-tune music box with bells and zither; and a picture clock with sonnerie and music box. The time

line on these clocks extends from the 18th to the early 20th century.

The first clock we will discuss is a bracket or shelf clock. As you will see, this introduction will read like a detective story. I was attempting to determine the facts about the maker and circa of this beautiful and complicated clock (Figure 1A).

The dial (Figure 1B) has the date 1625 on it as well as the maker. The name engraved on the dial, LUKAVETZKI (Figure 1C), is not listed in the reference books I have: Britten's *Old Clocks, Watches, and Their Makers*; Baillie's *Watchmakers and Clockmakers*



Figure 1A. The clock.



Figure 1B. The dial.



Figure 1C. Close-up of the signature.

of the World, Vol. 1; and Loomes' *Watchmakers and Clockmakers of the World*, Vol. 2. However, based upon the general construction, including the crown wheel escapement, I'd place this clock early in the 18th century, not 1625 as inscribed on the dial.

In doing further research through the NAWCC's "Answer Box" and Henry Fried, we get into a dilemma. Mr. Phil H. Tuseth was the "Answer Box" respondent. He located a Johannes Lukavetski, Master Clockmaker, 1753, in Brunn (Brno) Moravia. This is now Czechoslovakia. The source of this information is Jurgen Abeler, a writer and horological researcher, from his book *Masters of the Clockmakers*

Art printed in German.

A close examination of the signature on the dial (Figure 1C) indicates that the "GG" in Brugg was superimposed on what possibly could have been "NN" in Brunn. Brugg is located in Switzerland. Henry Fried also suggests the possibility of Bruge (Belgium), as the dial has a Dutch style minute track, or copied from the Dutch. He sent me a photocopy of a clock almost identical to the one we are discussing. The clock in the photocopy is attributed to Franz Weiskopf, Wein in the book *Alte Uhren* by Muhe & Vogel, published by Callewey. This clock even has the same flambeau finials. Mr. Fried dates these clocks around 1750. Clocks with false pendulums were in vogue in that period.

Did Lukavetzki originally make the dial in Brunn and then move to Brugg? What is the significance of the 1625 on the dial if Lukavetzki worked circa 1750? Any further information on these questions or another clockmaker with a similar name would be appreciated.

The provenance of this clock is also very interesting. According to family records, the clock was purchased originally by the owner's grandfather at auction about 1890 in Germany. The clock was in the collection of King Ludwig II and brother Otto of Bavaria. Ludwig was deposed on account of lunacy. He later committed suicide in the Starnberg Lake on July 13, 1886. His goods were confiscated and sold at public auction. This clock was purchased at this

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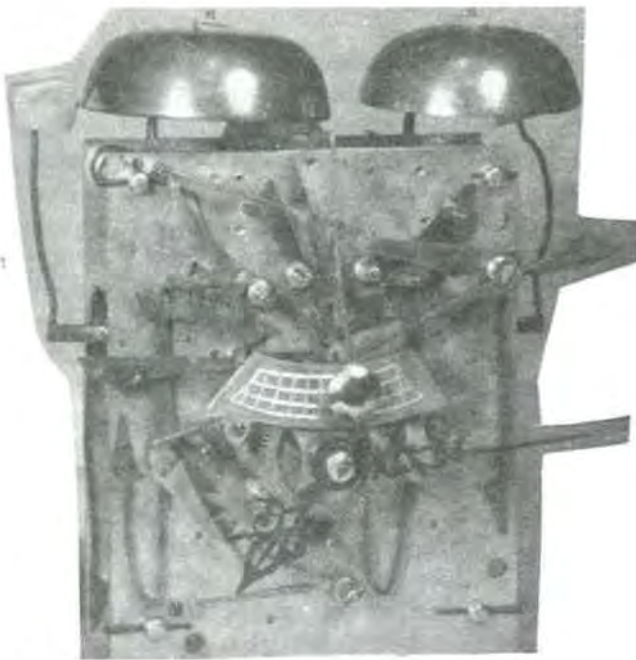


Figure 1D. Movement front view.

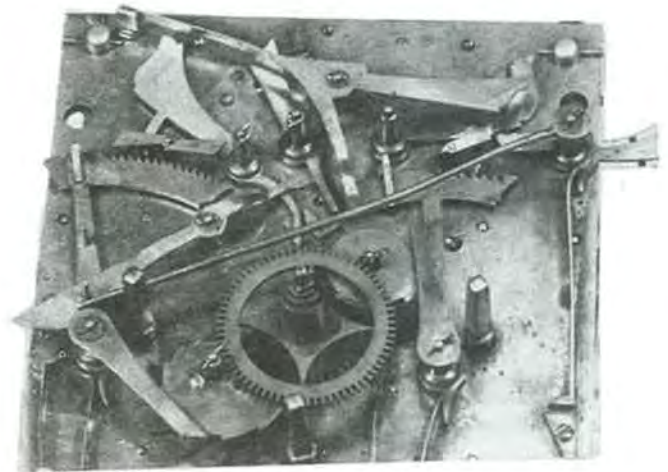
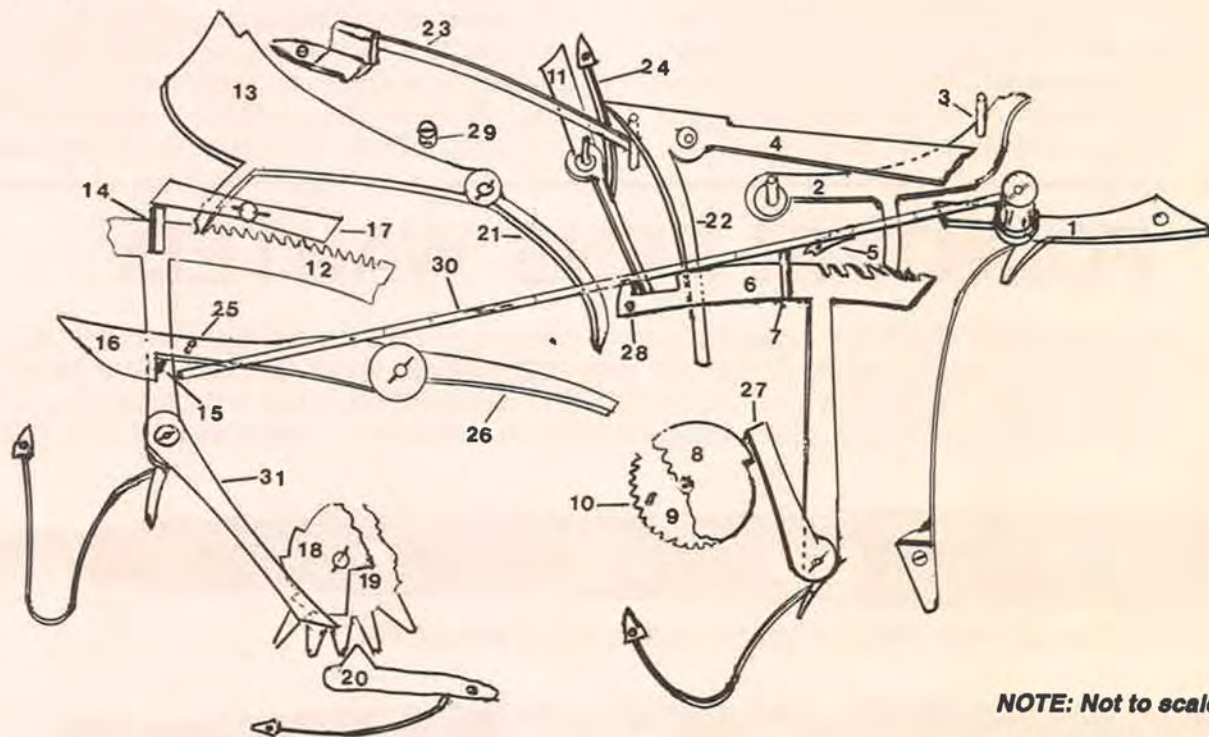


Figure 1E. Strike control mechanism.

Figure 1F. Strike control system.



NOTE: Not to scale

- | | | |
|----------------------------------|--|---------------------------------|
| 1. Repeat lever | 12. Hour strike rack | 22. Filrt tail |
| 2. Quarter rack hook | 13. Hour strike rack hook | 23. Filrt spring |
| 3. Quarter rack hook lift pin | 14. Hour strike rack pallet stop | 24. Strike warning lever spring |
| 4. Filrt | 15. Hour strike rack lock pin | 25. Lock lever lift pin |
| 5. Quarter gathering pallet | 16. Hour strike rack lock lever | 26. Lock lever tail |
| 6. Quarter rack | 17. Hour strike double-winged gathering pallet | 27. Quarter rack tail |
| 7. Quarter rack pallet stop | 18. Hour strike snail | 28. Hour strike unlocking pin |
| 8. Quarter strike snail | 19. Star wheel | 29. Hour rack hook stop |
| 9. Minute wheel | 20. Jumper | 30. Repeat lever extension rod |
| 10. Quarter strike lift pins (4) | 21. Strike rack hook tail | 31. Hour rack tail |
| 11. Strike warning lever | | |

auction. However, both Messers Fried and Tuseth said they were familiar with King Ludwig's taste in clocks. This clock was not "schmaltzy" enough for his taste. The clock may have been an addition to the auction by the auctioneer.

This clock normally strikes quarters only on the first three quarters. On the hour it strikes four quarters and then the hour. It differs in one respect from a petite sonnerie. On the hour the petite sonnerie does not strike the four quarters, only the hour. In repeat there are two modes. If the repeat lever is pulled/pushed down lightly, the quarters only strike, except after the hour. After the hour, but prior to reaching the first quarter, four quarters are struck followed by the hour strike. Pulling the lever all the way down unlocks the hour strike train. Upon completion of the four quarter strikes, the previous hour is struck.

Our concentration in this discussion will be on the striking and repeater mechanisms. At the conclusion we will briefly describe some components which differ greatly from later clocks.

NOTE: The numbers following parts nomenclature (1) in the text refer to the schematic in Figure 1F and the numbers in Figure 1G.

OPERATION

Quarter Striking -- First Three Quarters

The quarter strike train does not have a warning run. Counterclockwise rotation of the minute wheel (9) causes lift pin (10) to contact the lower tail (22) of the flirt (4). A pin (not marked) under the left side of the flirt contacts the flat spring (23), building up compression pressure. This action continues rotating the flirt clockwise against its spring. The distance between the quarter rack hook lift pin (3) and the top of the right side of the flirt continues to increase. As the minute wheel continues to rotate in normal running, the flirt tail is let off the lift pin. When let off, the force of the compressed spring rapidly rotates the flirt against the quarter rack hook lift pin.

Lifting the quarter rack hook releases the quarter rack (6). The quarter rack spring normally under compression now moves the quarter rack counterclockwise until its tail (27) comes to rest on one of the first three steps of the quarter strike snail (8). Several actions occur simultaneously:

1. The left side of the quarter strike rack contacts the hour strike rack hook tail (21), rotating the hour strike rack hook clockwise. On the hour this would unlock the hour strike mechanism. However, in the first three quarters the hour strike rack is double locked; first, as normally by the hour strike rack hook which is released as described above; secondly, by the hour strike lock lever (16) which is only released on the hour. NOTE: In Figure 1E, the strike rack lock lever is shown in the wrong position. (This photo was taken as found before disassembly of the movement.) It should be above lock pin (15) as in

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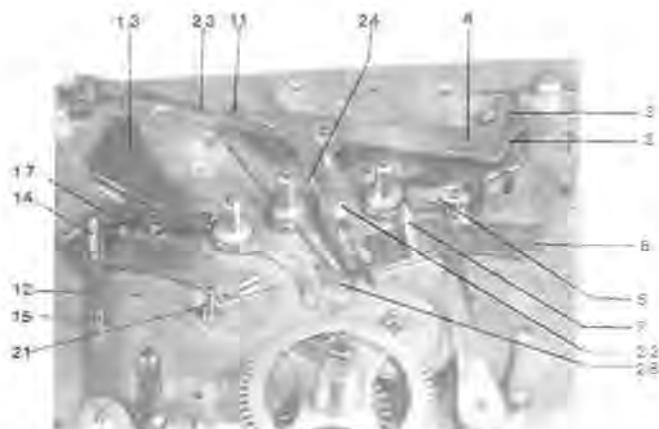


Figure 1G. Strike control, both trains locked.

Figure 1D & 1F.

In the first three quarters, the travel of the quarter strike rack is insufficient for the unlocking pin (28) on the left side of the quarter rack to contact the hour strike rack lock lever (16). Therefore, the hour strike rack does not move. The hour strike train is still locked by one of the wings of the strike double-winged gathering pallet (17) which is resting on the hour strike rack pallet stop (14). In this condition the hour strike train does not go into warning even though the hour strike rack hook is now off the rack which would normally release it.

2. The strike warning lever (11) is released from the position in which it was held by the left side of the slot in the quarter strike rack (Figure 1H). The strike warning lever spring (24) which is normally under compression now rotates the strike warning lever clockwise to its warning stop position. Since the hour strike train is locked, there is no movement into the warning condition as described in 1.

3. The quarter rack gathering pallet (5) is released from its position against the quarter rack pallet stop (7). This unlocking action allows the quarter strike system to go into its cycle. The gathering pallet rotates and gathers the quarter rack from one to three rotations depending on the step of the quarter snail that the tail rested upon. This action results in one to three hammer strikes. **NOTE:** Both the quarter and hour strikes are single strikes. In most petite sonnerie systems the quarter strike is double (ting-tang or bim-bam).

Quarter Striking on the Hour

On the fourth quarter (fourth lowest step on the snail) the initiating action is the same as for the first three quarters. The main difference is the unlocking of the hour strike train and the resulting operation (Figure 1H). In discussing this part of the operation we will start at the point where the quarter rack is released and its tail comes to rest on the fourth (lowest) step of the snail. As above, several actions take place simultaneously:

1. The left side of the quarter strike rack contacts the hour strike rack hook tail (21), rotating



Figure 1H. Strike control, fourth quarter. (Components shown are the same as in Figure 1G.)

the hour strike rack hook clockwise. This contact is quite forceful. Since the rack hook is not spring loaded it rotates vigorously. A stop pin (29) is provided to prevent the rack hook from rotating too far and jamming under the flirt spring. This stop pin also limits the counterclockwise rotation of the strike warning lever.

2. As the quarter strike rack travels counterclockwise it releases the strike warning lever (11) which is normally held in the unlocked position by its tail against the left side of the slot in which it rides. It is now rotated clockwise by the strike warning lever spring (24).

3. On the lower left side of the quarter strike rack is the strike unlocking pin (28). As it travels counterclockwise, it contacts the tail (26) of the hour strike rack lock lever (16). This rotates the lock lever clockwise, lifting it off the hour lock pin (15). This allows the rack to fall and its tail to contact a step on the hour strike snail under pressure of its return spring.

4. Movement of the hour strike rack counterclockwise pulls the hour strike rack pallet stop (14) from under the wing of the gathering pallet. This action allows the strike train to actuate into warning. The movement is stopped when the pin on the warning wheel of the strike train contacts the extension of the warning lever which protrudes through the plate. The hour strike train is now set up to operate upon completion of the four quarter strikes.

As the quarter strike rack is gathered, it rotates clockwise. As it completes the fourth strike, the tail of the strike warning lever contacts the end of the slot in which it rides. This rotates the lever counterclockwise against its spring, releasing the strike train.

Operation of the hour strike train is normal with one exception. As the hour strike train completes its cycle, the hour strike rack lock lever locks onto the lock pin. This occurs just before the wing of the gathering pallet seats on the pallet stop. There is no spring on the lock lever. Rotation is by gravity.

In Part II we will discuss the operation of this clock in repeat and strike silent. □

SEEKING PROSPECTIVE CANDIDATES FOR THE AWI BOARD OF DIRECTORS

The committee involved with securing candidates to run for the AWI Board of Directors is seeking recommendations from the membership. If you plan to suggest a possible candidate, please send that individual's name and background to: Mr. Robert F. Bishop, Chairman; Nominations for Board of Directors Committee; AWI Central; 3700 Harrison Avenue; Cincinnati, OH 45211.

Each recommendation will be carefully considered by the committee. Candidates will be selected on the basis of their past local association or AWI experience, geographical location, present job status, horological experience, and willingness to serve.

Mr. Bishop must receive all recommendations before December 31, 1992 to be considered for the 1993 election.



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AWI'S PROJECT EXTEND COMPLETES 2ND YEAR

The Education Center of Project Extend has more than fulfilled its mission during its two years of operation. Designed to offer five-day upgrading classes for those who want to fine-tune their skills, the Education Center has offered a full complement of classes.

Related technology classes included Watch & Clock Case Repair and Jewelry Repair. Beginning classes in Clock Repair, Lathes, and Quartz Watch Repair have been well received. The emphasis of the program is on improving skills in lathework and a variety of watch and

clock repair techniques. Advanced courses have been offered in clocks, lathework, and quartz watches. Highly specialized watch skills have been taught covering escape-ments, hairspring vibrating, timing, and complicated watches. Antoine Simonin, Director of WOSTEP in Neuchatel, Switzerland, was a visiting instructor this June conducting a special complicated watch course.

Project Extend is the answer to industry's often-asked question, "Why doesn't somebody do something to improve the skills of today's craftsmen?" AWI is not only addressing this need, but the good news is the courses are free for members. Through the cooperation of AWI's ELM Charitable Trust, financial assistance with room and board is available for members who might need assistance.



Special Complicated Watch Course: Instructor, Antoine Simonin, WOSTEP director (center).



Escapements, Staffing, & Dynamic Poising: Instructor James Lubic (not shown).



Hairspring Vibrating & Timing: Instructor, Harold Herman (back row, far left).



Advanced Lathe: instructor, Archie Perkins (center).

Housed in a new modern 1000-sq.-ft. facility, the center is conveniently located off of I-74 just a few miles from AWI Central on Harrison Avenue in Cincinnati, Ohio. Participants have a variety of restaurants to choose from and very special motel rates have been arranged for students attending AWI classes.

Plans for future years of operation are moving forward. James Lubic, Manager of AWI's Education & Technical Services, is presently involved in advanced training in Switzerland. Lathe course instructor Roy Hovey is also involved in this training. We have already planned to broaden the scope of instruction in the advanced areas during the third year of operation. Watch for the listing of Project Extend classes for 1993 and beyond, which will appear in *Horological Times*. We welcome suggestions for classes--classes that will meet the special needs of our changing field.

The photos shown here are from a few of our most recent classes. Those who are interested in this training opportunity are encouraged to contact AWI Central now for a General Brochure explaining how Project Extend operates and to ask for brochures on specific classes in which they are interested.

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Ask Huck

CLOCKMAKING BITS

By J.M. Huckabee
CMC, FBHI

About . . .



PIVOT HARDNESS

and

TOWER CLOCK HANDS

Q. Most texts on clockmaking advise to anneal an arbor before drilling for a new pivot. I've noticed old American clocks appear to have soft arbors. Is it necessary to anneal these and afterwards harden the new pivot?

A. Your observation is indeed correct. Pivots in the clocks you mentioned are soft; the arbors are made from drawn mild steel wire. In fact, they will not harden when heated and quenched.

In this type of job I test the arbor with a fine-cut file. If the file can readily cut the arbor, most any commercial or handmade drill will cut it easily.

The American clock arbors drill easily and I like to sink the hole about six diameters deep. Make the pivot from a similar piece of mild steel; cut a very slight taper that will reach almost to the hole bottom. The new pivot is driven in place and straightened as necessary. It is then finished to length and diameter. Surface finish with a burnisher.

In this job it is not necessary to heat-treat the new pivot. The logic for this decision is that all the original pivots were not heat-treated.

Why were the pivots left soft in the first place? These old clocks were the marvel of the world in their period of manufacture. They are robust and reliable beyond many finer clocks of their era and manufactured at an affordable price for the working man's home. The number that have endured 50-100 years attest to their greatness. Soft pivots which have that record of performance need no significant improvement!

While speaking about soft arbors and pivots, I've observed that bent arbors can be straightened with a very high degree of confidence that they will not break. Repivoting these old clocks usually results from wear, not breakage.

The pivots are large enough to permit polish-

ing out some degree of wear without danger of breakage. The ease of bushing worn pivot holes makes these old clocks easy to renovate. The large lantern pinions have considerable forgiveness for bushing error which is not true of many European clocks of the same era.

Now for a suggestion on drilling methods: Be sure the arbor is straight before drilling. It's best to drill through a cup center supporting the arbor. An alternate method is to support the arbor near its end by a steady rest. Many of the arbors are not round and the surface finish is poor. Use reasonable precaution and the job will turn out well.

Q. How are the hands for tower clocks made? How often must they be replaced and how is it done?

A. Hands are made in many ways. My information relates only to those with which I have had experience.

Most of the replacement hands I am familiar with were manufactured by the Time Equipment Division of IBM, or were made on a local basis. Original hands in old clocks were mostly of painted wood with wood dials. The dial had a door 1-1/2 feet square through which the hands were accessible. Most IBM dials were vitrolite with no access. A crane or scaffold was required to remove and replace hands.

I've seen hands of box-like construction made of sheet copper or galvanized sheet steel. These were usually painted. Most hands have a hub of cast brass or gray iron keyed to the shaft and bolted to the hand. The hub has a large flange with four to eight bolts through each hand.

Most IBM hands were called smalted. The hands were made of a straight-grained wood, treated to resist rot, and the surface smalted. The hands were coated with an adhesive, then the smalt applied. Smalt is a crushed glass-like material that is a deep blue-black color with edges very sharp. The grit size

is a little larger than masonry sand. Smalt does two things: (1) it gives color and protects the finish, and (2) it repels birds. Birds don't like the sharp grit on their feet! Imagine the problem of a dozen pigeons sitting on the hands of a clock at 9:15.

I made field replacement hands that proved to be very good. An outline of the hand was drawn on a strip of paper and then a millwork shop would bandsaw the new hand from a piece of straight-grained cypress lumber. Typical hand thickness for a six-foot dial is about a half inch. After mounting holes were drilled, a roofing contractor would dip these in his asphalt kettle for a few minutes. We usually sprinkled the hands with masonry sand while the asphalt was hot. I'm certain that some of those hands are now more than 40 years old and still in good order.

Hands should be at least six inches away from the dial and a similar hand-to-hand spacing. This is suitable in the southland where winter sleet is a problem. In areas of heavy snowfall the spacing must be greater. New hands must have the counter-balance weights adjusted. These weights are usually inside the tower but sometimes are found on the tails of ornate hands. □

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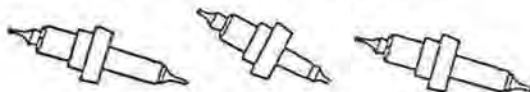
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JEWELRY CRAFTING AND REPAIR Diamond and Stone Setting

Part IV

So far in this series about stone and diamond setting we have only discussed prong type settings. There is much that we haven't touched on, so we'll continue with prong settings.

Cabochon stones are oval or round with flat bottoms and smooth-domed tops. Many stones are available in cabochon cuts, such as star sapphires, black onyx, hematite, turquoise, all linde stars, and many other stones. Although they can be bezel-set, many are prong-set in solid base or gallery settings. Most faceted stones are not flat on the bottom, but the bottom is faceted on a taper from the girdle to the culet.

Rectangular or emerald (octagon) cut that are faceted on top are rarely flat on the bottom. Faceted stones must be set in a gallery type setting, usually using four prongs. In any faceted stones, the space from the girdle to the culet (below the girdle) may vary, but it is usually about two-thirds the thickness of the stone. Thus, the larger the stone, the greater the thickness below the girdle. This factor should be given special consideration in setting stones, because if the setting is not deep enough the culet will protrude through the bottom of the setting and the inside of the ring. This is not a good situation, for if this ring is placed on a ring mandrel that has no groove, it will push the stone out of the setting after it is set. If set securely enough, it can even break the stone. Since ring mandrels are available with a groove, this situation must exist in many rings, for that is the purpose of the grooved mandrel. Even in sizing or repairing stone-set rings, this should be noted before putting any open back stone-set ring on a mandrel, and caution used accordingly.

Solid back stone-set rings should be discussed because they are always problems for the jewelry craftsman when making repairs or alterations on this type of ring. Usually on both sides of the stone the mounting is hollow. Since the stones are hollow, they are not water-tight, and moisture gets inside, carrying dirt with it. This often makes the stone look dull. If heat needs to be applied to this setting, gold solder will not flow because the dirt will boil out over where the solder needs to flow.

These solid backs are mostly found with bezel-set stones; we will reserve further comment on them when we discuss bezel settings.

Flat-bottom stones of most any shape can be set in very shallow settings. The setting of rectangular stones with prongs requires two prongs on each side and two on each end close to the corners. The prongs should fit snugly at the bottom of the stone before bending them over the sides and top. The width and thickness of the prongs is determined by the size and hardness/toughness of the stone.

In setting delicate stones such as emerald, amethyst, turquoise, or other delicate stones, the prongs should be as small as possible but strong enough to hold the stone securely. Heavier prongs increase the risk of chipping the stone when bending them over the stone or tightening them. In bending them over the stone, you should bend them just a little and always work them in pairs, going from one to the next directly across from the one just bent over. When starting to bend these prongs, use a chain nose or flat nose pliers in this way: Hold the pliers vertical to the stone, straddling two prongs opposite each other; then squeeze. This will bend these two prongs slightly over the edge of the stone. Repeat this on the other pair(s) of prongs. All should be bent slightly over the stone as the angle of the plier jaws will press the prongs over at an angle of possibly 10 to 15 degrees. This should hold the stone firmly in place and be level if the seat has been properly prepared.

Using setting pliers, the prongs can now be pressed tight against the top of the stone. It is wise to always tighten them by pairs on opposite sides of the stone. When they are all tight, they can then be cut to length if they protrude too much over the stone. Use a jewelers saw with a fine blade. Care should be taken not to scratch the softer stones with the saw blade. Also, when cutting the prongs on the hard stones, the saw blade can be dulled. This leaves the ends of the prongs in a square shape so they can be shaped with a needle file that has one smooth edge (a barette needle file works fine). They can be filed to a round shape or left somewhat

pointed if this is the look you would like to create.

If a round end on the prongs is desired, use a cup bur in the flex-shaft tool. Using a cup bur larger than the width of the prong will round only the end of the prong; when polished with tripoli and rouge, you will have a very attractively finished job. The rounded ends of the prongs are less apt to catch on clothing or other materials than if made pointed. Round and oval flat bottom stones can be set with as few as four prongs. Emerald-cut or octagon-shaped stones can also be set with as few as four prongs. The prongs on emerald-cut stones are positioned to bend over the corners that are cut off, so when the prongs are bent to face to the corner diagonally from it four prongs will hold the stone securely.

Faceted stones other than round with the underside being two-thirds the thickness of the stone must be set in a deep setting so the culet will not protrude into the inner circumference of the ring. If it is an open type setting, it will need a bearing for a seat to hold the girdle which, when the prongs are tightened, will not let the stone turn or move. This is one reason that so few prongs are needed to hold the stone securely. In the manufacture of jewelry, settings can be manufactured to fit stones that are purchased in large lots. These are precision cut so they are identical in size and shape, and any stone can be set in any of these settings with very little effort or alteration. When we get a stone replacement for a lost or broken stone, we have to order a standard size and cut stone which in all probability

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will not be identical to the original. I have found in genuine stones that when ordering three or more of a size, none of the three are identical. Some will be slightly smaller in size and some thicker or thinner than the others. With synthetic stones there is more uniformity in size and thickness, but even these can vary if they come from a different manufactured lot. These are the reasons that we need to know how to alter settings to fit the stones, or sometimes even reduce the size of the stone slightly to make it fit the setting.

In doing jewelry service work, some odd situations present themselves. For instance, I have had rings brought in where the stone was pushed through the bottom of the setting due to an inadequate seat. This required making a new seat using gold wire, and gold-soldering it in the inside of the setting. Then this seat usually has to be altered to allow the stone to seat properly in order for it to be set level at the proper depth. This alteration can be done mostly using burs in the flex-shaft tool, but to get in small corners, hand engraving is required to remove high places in the metal seat so that the stone seats fully, level, and at the proper depth. To be a complete stone setter requires a lot of ingenuity, common sense, and logic. I cannot repeat too often to always check the hardness and toughness of the stone you are setting. Handle the stone accordingly when preparing the prongs when either bending or tightening them.

Setting baguette stones for missing or broken ones often requires altering or even replacing the settings. Usually baguettes are thought of only as diamonds, but I've seen some colored stones in fancy multi-stone rings that were baguettes. The stone listings do not include colored stones in baguettes, but white cubic zirconia is listed in a complete list of sizes to fit the settings listed in the settings catalog. There are some variations in sizes of the cubic zirconia and the settings listed, so when converting, some alteration in the settings may need to be made. I can find no listing for baguettes in the colored cubic zirconias, but these colored ones are relatively new. They may even now be available in baguette cuts.

The setting for baguette stones is actually a rectangular box with the ends higher than the sides. The excess length on the ends is the metal to be bent over the ends of the baguette stones that form a prong on each end. As they cover the complete end of the stone, they could be considered as half bezels. The baguette

stone is a rectangular or tapered rectangle (sometimes referred to as a keystone cut), and the underside of the stone is tapered. It is also approximately two-thirds the thickness of the stone. Therefore, in preparing the seat, the edges on the sides need to be filed or cut to form an angle to match the taper of the underside of the stone. When this is done and the stone is set in place (if it seats well, level, and tight), the prongs can be bent over the ends with setting pliers. It is best to bend the first prong slightly and move to the one on the other end and bend it slightly also. Alternate from one end to the other, bending each a little at a time until the prongs are tight and the stone secure. Finishing them will require very little filing, unless the prongs extend too far, in which case they can be cut back with the jewelers saw or a needle file with one edge smooth.

Diamonds are the most used baguette stones, and there is little chance of damaging these in setting. However, with any of the softer, fragile stones, care must be used in bending the prongs, for the stones will chip or break easily. Cubic zirconias are not too hard or tough, so use special care in setting them.

Pin-point settings for round stones are found in both gent's and ladies' diamond settings. Actually, the pin-points that stand up can be bent over the girdle of the stone, serving as prongs and finished to look like beads. The pin-point setting usually has four pins protruding. These are available in 14K white gold for diamond sizes from 1/16 to 1-1/4 carat stones. Each size will take diamonds that may vary in size.

For example, one listed for a 1/16 carat stone will take stones from diamond size .04 to .08 points; and a 3/8 carat will take diamonds from .35 to .39 points, which shows a .04 point variation for each carat size listed in fractions. Larger than 3/8 carat settings will allow a larger point variation. In setting these, have a seat cut with a setting bur the exact diameter of the stone to be set. When the stone is in place, if the base of the prong is too heavy to bend easily, a notch can be cut in the base of the outside of the prong with the jewelers saw. This will allow the prongs to bend over the stone, and then they can be tightened with a beading tool or setting pliers. These can also be shaped with cup burs or hand gravers.

This will conclude our discussion on prong settings. In next month's article we'll discuss bezel settings.



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Part LXXXII

THE VERGE ESCAPEMENT USED IN WATCHES

One of the most important units of the watch is the escapement. It is this unit which transfers the power of the train to the balance wheel and hairspring, the timekeeping unit of the watch. In other words, the escapement changes the circular motion of the train to vibratory motion of the balance wheel and hairspring.

One of the earliest escapements used in watches was the verge escapement. Therefore, if one restores antique watches, it will be necessary to repair and adjust the verge escapement at some time or other.

The verge escapement is a "frictional rest" escapement. There is no pallet fork; therefore, the escape wheel teeth are always resting on the pallets which are attached to the balance staff, except during the drops.

Figure 1 shows a watch verge escapement. The balance staff, which is the axis for the balance wheel, is called a verge staff. The verge staff has two pallets for the verge escape wheel teeth to work against alternately. The pallet next to the balance wheel is the upper pallet and the other one is the lower pallet. The locking faces of the two pallets are situated on the staff 100 degrees apart as one views them from the end of the staff. The escape wheel is of contrate wheel design; that is, the teeth extend up from the plane of the wheel instead of out with the plane of the wheel as in

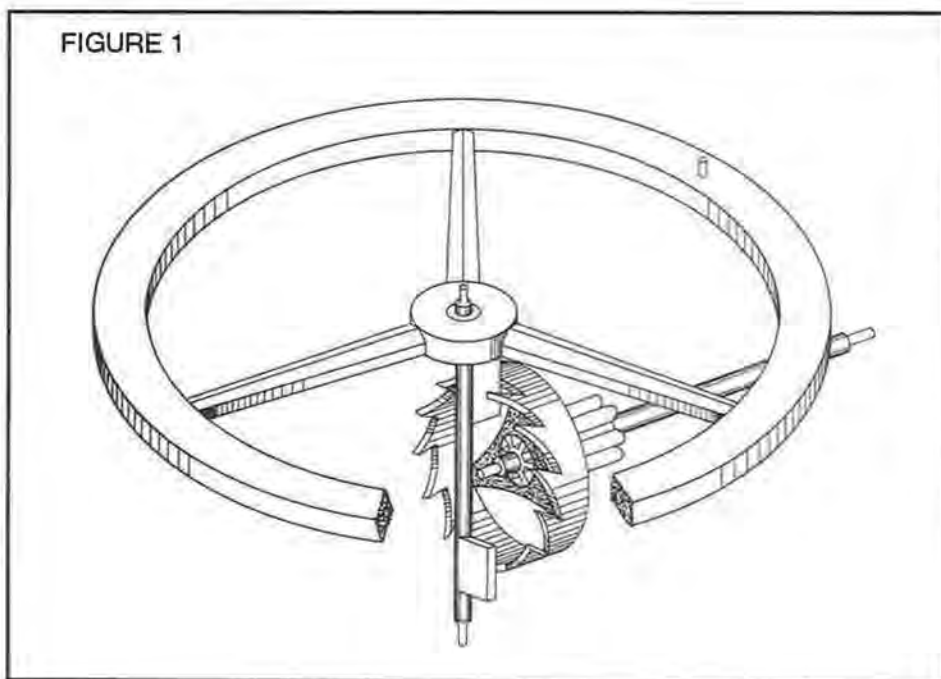
the case of a regular train wheel. The axis of the escape wheel is set at right angles to the verge staff. The verge staff runs in a vertical position and the escape wheel pinion runs in a horizontal position.

Figure 1 shows a tooth of the escape wheel locked on the upper pallet of the verge staff. The escape wheel must have an odd number of teeth for the escapement to function. When one tooth is locked on a pallet, there must be an empty space between two teeth to clear the other pallet. The escape wheel can have 11, 13, 15, 17, or more teeth as long as the number is uneven. The verge staff is centered with the escape wheel.

The balance wheel has a banking pin extending up from its rim to limit the motion of the balance wheel. This pin banks against each side of the balance cock if the motion becomes too much. On some verge watches, the banking pin extends down from the bottom of the balance wheel rim and banks against the ends of the regulator cover on the upper plate. Another method sometimes used is to bank the upper pallet against the end of a small pin that has been set into the edge of the hole in the upper plate which the verge staff goes through.

The hairspring is situated underneath the balance. The hair-

FIGURE 1



spring collet frictions onto the balance wheel hub. (The hub is not shown.)

THE ENGLISH VERGE ESCAPEMENT

Figure 2 shows how the escape wheel is held in position in an English verge watch. View A shows the escape wheel with its pinion. The potence is shown in View B and the counter potence is shown in View C. The potence and counter potence are fastened onto the underside of the upper plate. The potence is held to the upper plate with a screw and steady pins, whereas the counter potence is fastened to the plate by riveting.

The potence B carries the upper escape wheel pivot as well as the lower end of the verge staff shown at F. The lower verge staff

pivot rests in a hole in the plug shown in View "c". The upper escape wheel pivot works in a hole in the dovetailed bar shown in View "a". This bar can be shifted in its dovetailed slot for equalizing the drops on the escapement.

The counter potence has an adjustable plug shown at D which is used to adjust the endshake on the escape wheel. This plug is called a follower. The rounded section on the follower is slightly tapered so it will fit friction tight in the hole in the counter potence. View E, Figure 2 shows the reversed end of the follower. The hole for the escape wheel pivot is shown at "d", Figure 2.

When the follower is shifted inward in the counter potence, the endshake on the escape wheel is decreased and the lock of the es-

FIGURE 2

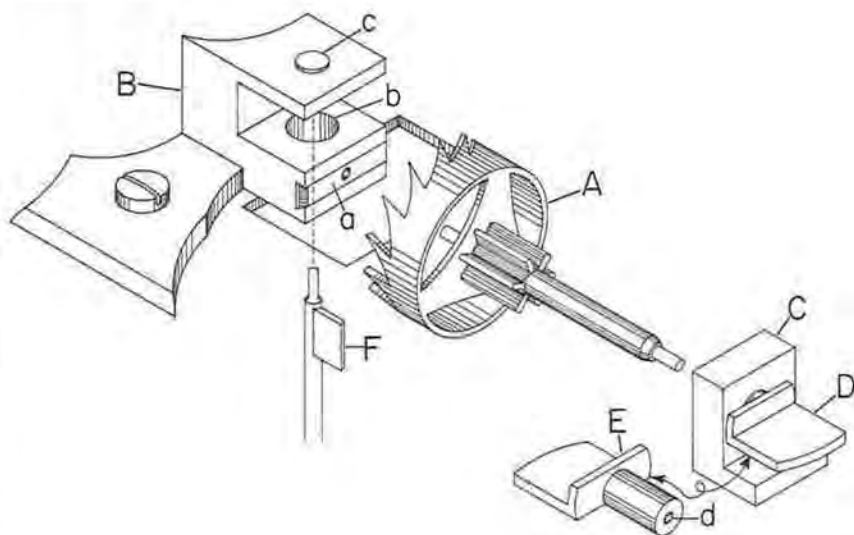
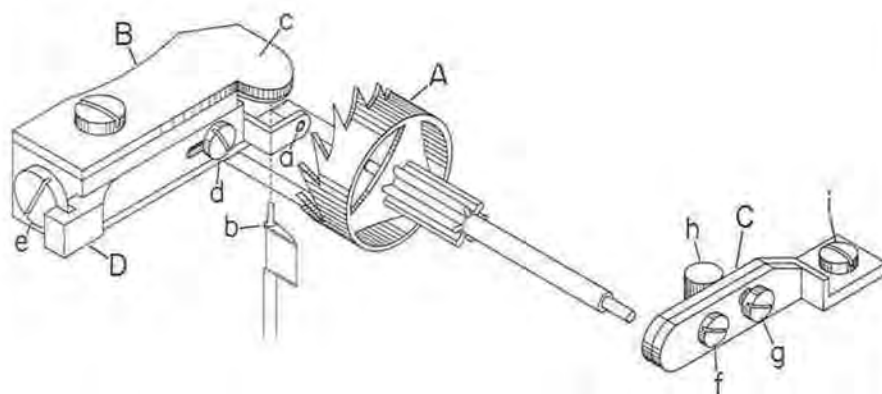


FIGURE 3



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cape wheel teeth on the pallets is increased. When the follower is shifted outward in its hole in the counter potence, the endshake is increased and the lock is decreased on the escapement. Note: Adjustments to the English verge escapement should be done while the balance and escape wheel is assembled to the upper plate before the watch has been assembled.

THE FRENCH VERGE ESCAPEMENT

Figure 3 shows the French verge escapement. The French method of adjustment is more precise than the English method. The escapement adjustments can usually be done with the watch assembled on French watches. This is due to their

design. The escape wheel and pinion is shown at A. View B shows the potence and View C shows the counter potence. The upper pivot of the escape wheel fits into its hole "a" near the end of slide D. The lower pivot of the escape wheel fits into its hole in the counter potence. The lower pivot "b" of the verge staff fits into its hole in the potence B. Plate "c" on top of the potence serves as a cap for the lower verge staff pivot.

EQUALIZING THE DROP

To equalize the drop on the escapement, one would move slide D back or forth in its slot on the side of the potence. Two screws are used to control the slide. Screw "d" is used to lock the slide into position and

screw "e" is used to move the slide back and forth in its slot. Note that the edge of the head of screw "e" works in a slot in the slide to move the slide back and forth in its slot. To equalize the drop, one would loosen slightly screw "d". Then screw "e" is turned clockwise to advance the slide and one would turn the screw "e" counterclockwise to retract the slide. After the drops have been equalized, the locking screw "d" is tightened to maintain the position of the slide.

Unequal drop is usually caused by the center of the escape wheel being off center with the verge staff. To correct this condition, one must shift the escape wheel back on center with the verge staff by shifting the slide that supports the upper escape wheel pivot. The escape wheel is shifted toward the pallet which has the greatest drop onto the pallet face.

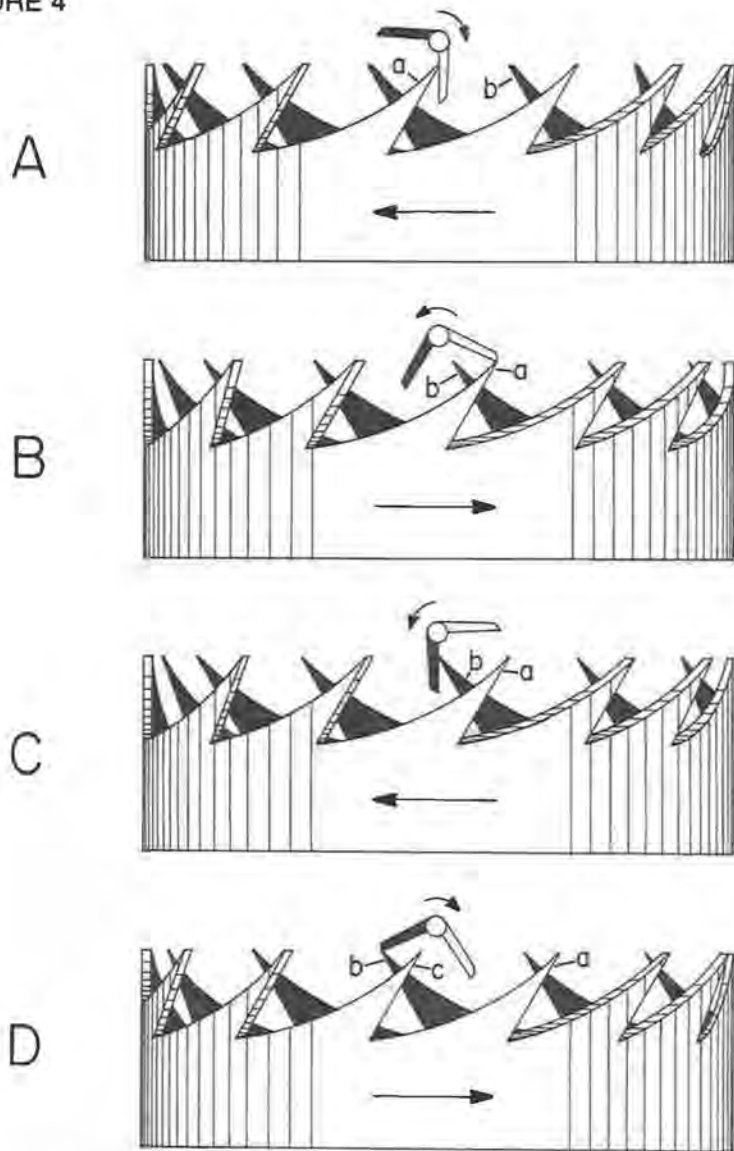
ADJUSTING THE DEPTH OF THE ESCAPE WHEEL

To adjust the depth of the escape wheel teeth into the verge, one would manipulate the device on the counter potence which is intended for this purpose. Figure 3, View C shows the French counter potence. The following is a description of its use. Screw "f" is used to hold the cap to the potence. Screw "g" is used as a depthing screw for changing the endshake of the escape wheel. The end of this screw goes against post "h" which is frictioned into the upper plate. Screw "i" holds the counter potence tightly into position on the upper plate. A steady pin is placed in the base of the counter potence between screw "i" and the end of the base. This gives a pivot point so the base can be swung back and forth to make adjustments for endshake on the escape wheel. The hole in the base of the counter potence for screw "i" is enlarged enough to allow for the potence to be swung for the adjustments.

INCREASING THE LOCK

To increase the lock on the escape wheel, one would first loosen screw "i" slightly to allow the counter po-

FIGURE 4



tence to be moved. Then screw "g" is backed up slightly by turning it counterclockwise. Next the counter potence is held so the end of screw "g" is against post "h". Then the base screw "i" is tightened so the counter potence is locked into position. This procedure is repeated if necessary to obtain the correct amount of lock. Note: As the lock is increased, the endshake on the escape wheel is decreased.

DECREASING THE LOCK

To decrease the lock, one would use the same procedure except, in this case, screw "g" is advanced by turning it clockwise. As this is done, the counter potence will be backed away from the post through the action of the end of screw "g" against the post. The endshake on the escape wheel is increased by this action and the lock is made less.

When the lock is increased, the drops are at the same time decreased; and when the lock is decreased, the drops are increased.

THE ACTION OF THE VERGE ESCAPEMENT

Figure 4 shows the sequential action of the verge escapement. View A shows tooth "a" of the escape wheel locked on the face of the upper pallet. This is at a point during recoil. The verge staff is turning clockwise and the escape wheel is backing up against the force of the train as is shown by the arrow on the escape wheel. This is an undesirable action, but it is a characteristic of the verge escapement. At the end of the recoil, the balance wheel reverses in the opposite direction which allows the escape wheel tooth "a" to slide down the pallet to give impulse to the balance wheel. This impulse is referred to as lift. This is shown in View B. Note that the black tooth "b" has advanced toward the lower pallet shown in black. As soon as tooth "a" drops off of the white pallet, then tooth "b" drops onto the black pallet. The escape wheel is turning in the direction of the arrow. The balance wheel and its staff are turning in the direction of the small arrow during this action. View C shows the recoil taking

place on the black pallet. Then the balance wheel reverses after recoil which allows the escape wheel to reverse and the black tooth "b" to slide down the pallet giving impulse or lift to the balance. This is shown in View D. At the end of impulse, the white tooth "c" will drop onto the white pallet and the escape wheel will recoil before tooth "c" impulses the balance wheel. This is a complete cycle of the escapement's action.

SPECIFICATIONS OF A VERGE ESCAPEMENT

Specifications of a verge escapement are as follows:

- A. Opening of the pallets should be 100 degrees.
- B. Lift -- Total lifting arc should be 40 degrees.
- C. Escape wheel teeth should be undercut 30 degrees.
- D. Maximum complete oscillation of balance -- 180 degrees.
- E. Width of each pallet should equal slightly more than one-half of

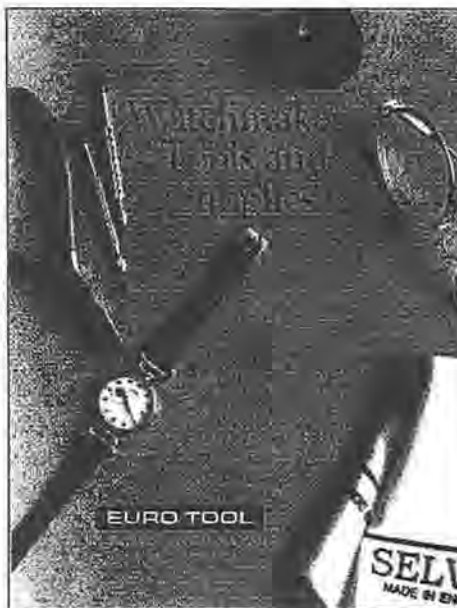
the space between the points of two escape wheel teeth.

F. Escape wheel teeth should overlap pallets approximately two-thirds of the width of the pallets for the correct amount of lock. This is measured from the center of the verge staff to the edge of the pallet.

Figure 5 shows layout drawings of the verge escapement showing the correct amount of lock, lift, and pallet opening. View A shows the correct amount of overlap of a tooth on a pallet at the center line of the escapement. This overlap or lock is two-thirds of the distance between the edge of the pallet and the center of the verge staff.

View B, Figure 5 shows a correctly laid out verge escapement. The escapement has 40 degrees of lift or impulse and a pallet span of 100 degrees. The width of the pallets is slightly more than one-half the distance between the points of two escape wheel teeth. These conditions cause the correct amount of lock and drop to be present. The

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Of particular note is the Battery Change Kit, which has sold well in a handy roll-and-tie pouch. This is an invaluable kit for department stores and other retailers who change batteries.

If you wish to have a copy of the new Watchmakers Tools Catalog contact your local distributor, or call 1-800-552-3131 for a copy and a distributor near you.

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drop is shown between the tip of tooth "b" and the black pallet.

EXCESSIVE LOCK

Figure 6 shows the effect of too much lock. View A shows a verge escapement which has too much lock. Tooth "a" lock is so deep that its tip is almost touching the body of the verge staff. This condition could cause the tip of the tooth to catch on the verge staff, as well as causing the escapement to set due

to the lack of leverage. This condition causes more pressure directly against the pivots of the verge staff. This causes more friction on the staff which causes the pivot holes to wear more quickly.

Other conditions are created when the lock is too heavy also. This is shown in View B, Figure 6. These conditions are too much lift on the escapement and too little drop. In this particular case, the lift is 60 degrees instead of

the 40 degrees needed. Note how small the drop is by observing the distance between the tip of tooth "b" and the black pallet. If the escape wheel should have uneven teeth, some teeth could hang up causing the watch to stop. Too much lock can cause the balance to overmotion and slow the rate of the watch.

INSUFFICIENT LOCK

Figure 7 shows a verge escapement which has too little lock. View A shows the lock at the center line. The tooth overlaps only one-half of the width of the pallet. The results of this condition are shown in View B, Figure 7. This light lock causes too little lift on the escapement. In this particular case, the lift is only 19 degrees when it should be 40 degrees. This condition also causes too much drop on the escapement. This is shown between the tooth "b" and the black pallet. This amount of drop is very excessive. Too much drop causes wasted power and excessive wear on the pallets, escape wheel teeth, pivots, and pivot holes. Also, the motion of the balance will be decreased, making the watch run fast.

"Antique Watch Restoration" will continue next month.



FIGURE 5

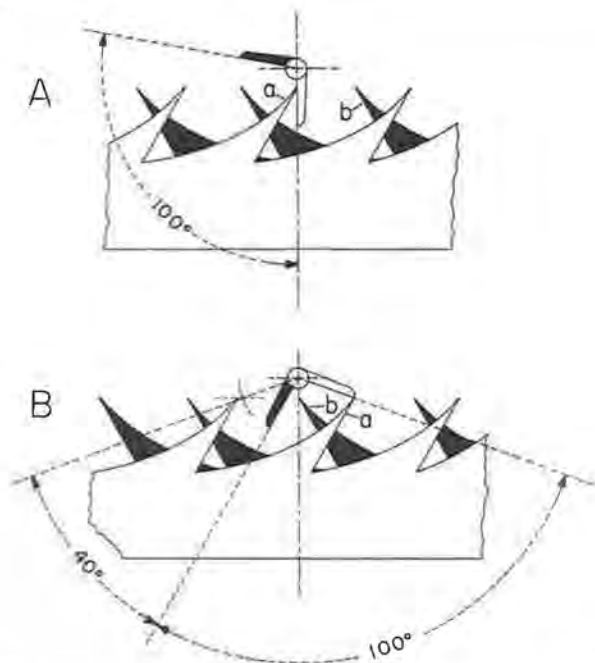


FIGURE 6

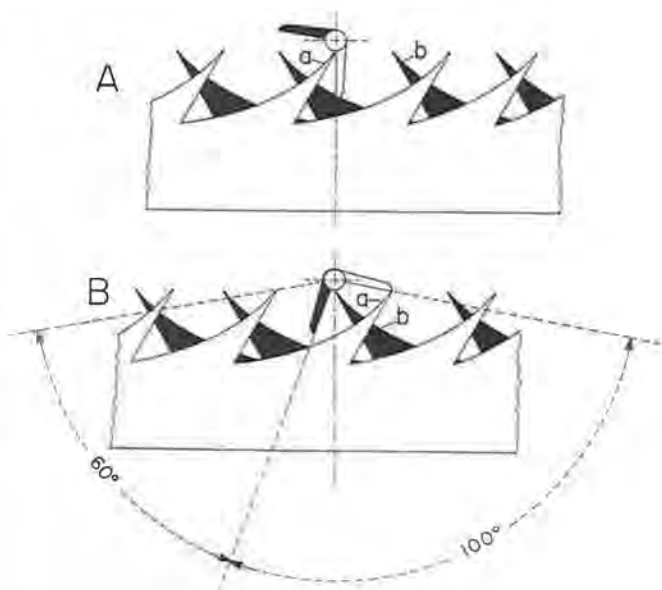
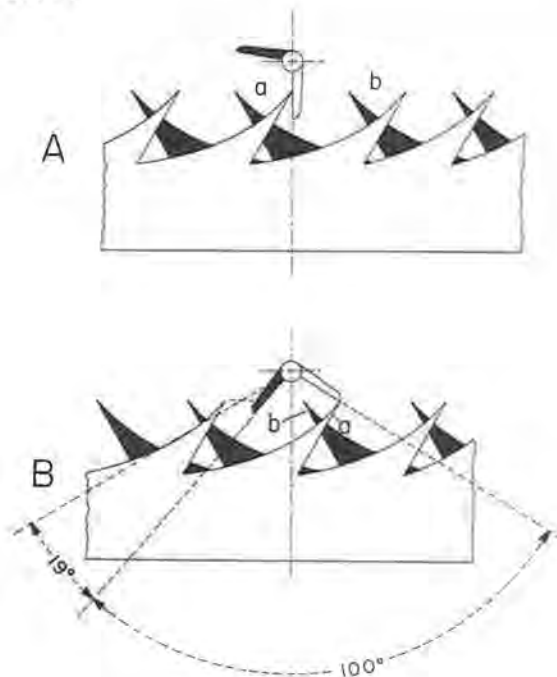


FIGURE 7



ASSOCIATION NEWS

ILLINOIS

The Illinois Watchmakers Annual Convention, sponsored by the Central Illinois Watchmakers Association, will be held October 23-25, 1992 at the Ramada Inn in Effingham, IL.

Friday's programs include Scott Chou presenting the Seiko Generator Watch and a Jewelry Round Table Session #1 by Werner Theobald.

Scheduled for Saturday are: Archie Perkins, Antique Watch Restoration #1; Werner Theobald, Jewelry Round Table Session #2; Mark Butterworth, Clock Repair and Movement Exchange; Randy Reliford and Martie Arnie, Rubber Moldings; and Werner Theobald, Jewelry Round Table Session #3.

On Sunday, Werner Theobald will present a slide show on "Gold Mining" and Jewelry Round Table Session #4. Antique Watch Restoration #2 by Archie Perkins is also scheduled.

For more information contact Fred Schroeder at (309) 829-6624 or 263-0371 or Chuck Ramsey at (309) 682-5773.

OHIO

The initial presentation of a new bench course on the Tissot 958 "Two-timer" was a prominent feature of the 46th annual convention of the Watchmakers Association of Ohio held in Columbus, Ohio on July 24-26, 1992. Dan Fenwick of Swiss

UPCOMING CONVENTIONS

October 3-4, 1992

*Watchmakers Association of Pennsylvania
Annual Convention
Penn State University Campus -- State College, PA*

October 23-25, 1992

*Florida State Watchmakers Association
Annual Convention
Howard Johnson Hotel -- Daytona Beach, FL*

October 23-25, 1992

*Illinois Watchmakers
16th Annual Convention
Keller Convention Center -- Effingham, IL*

Watch Technical Center conducted the hands-on workshop.

Representing AWI at the convention was President Wes Door and Executive Secretary Milt Stevens, a long-time WAO member.

New officers elected are: David M. Cooper, president; Harold B. Davis, vice president; and Don Foltz, secretary-treasurer. □



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A Fusee Barrel Mainspring Jig

Mainsprings in barrels occur most often in German or English clocks and their customary time and strike springs can be removed and reinserted by reasonably strong fingers. When a chime train mainspring is involved, it gives the old digits a bit more of a workout, particularly when the barrel is relatively deep. Things get a good deal more difficult, however, when we have to deal with the even more powerful mainspring which inhabits the barrel of an English fusee 'dial clock.' These clocks are heavyweight versions of the American gallery clock.

English fusee bracket clocks and dial clocks are built like a battleship, and any spring winder which has to cope with their powerful mainsprings had better be built likewise. Good quality spring winders are expensive, up to \$400 or more, but it is a serious error to try to use a cheap model on mainsprings which are roughly twice as powerful as the average 3/4" x 0.018" x 96" American jobs. Should anything on the winder fail, say the click slips or the handle breaks, then severe lacerations are almost a certainty.

Personally, I have never used a spring winder; I distrust them. I know of at least one pair of damaged hands and of several mainspring winder owners who likewise distrust them and no longer use them. The basic flaw in all winders is their use of a click. When the click is off, so are all bets; there are no safeguards and you're on your own. Mainspring winders would be far safer if they incorporated a worm drive instead of a click.



Figure 1. Fusee barrel mainspring jig.

A worm drive is somewhat slower to use and is not cheap, but as it is never disengaged and can be stopped at any angle, anytime, it is far safer than a click. And if your hand slips off the handle, the thing doesn't explode; it just sits there, all peaceable-like, with everything under control--perhaps waiting for you to stop holding your breath!

With the foregoing considerations in mind, it is not surprising that a great many clock repairers are most reluctant to remove mainsprings from barrels for cleaning. Nevertheless,

FUSEE MAINSPRING JIG

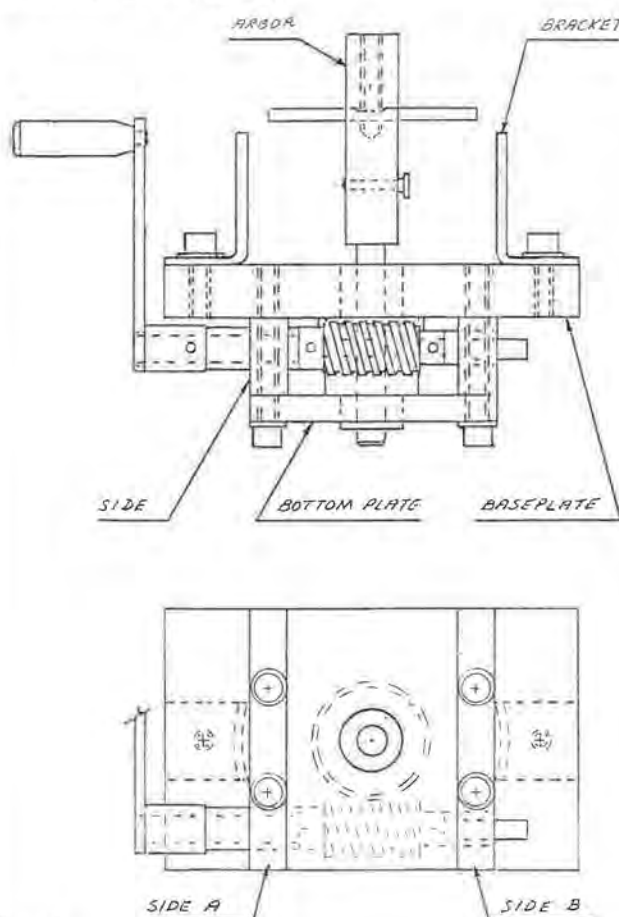


Figure 2

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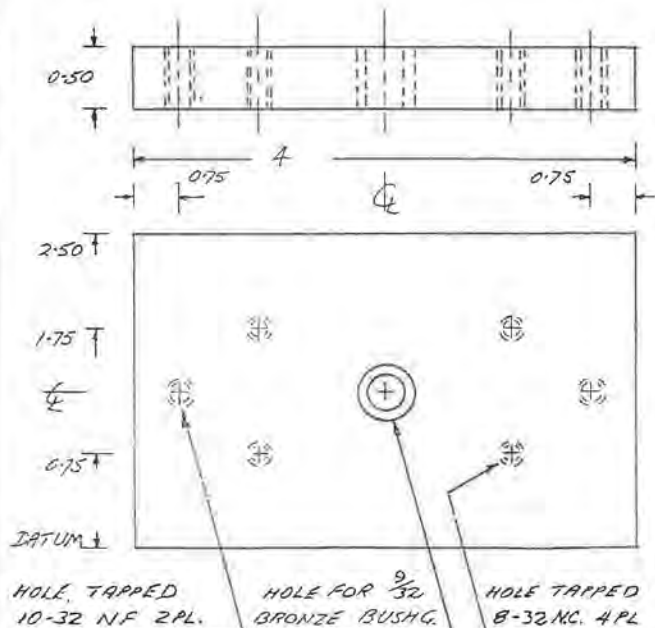
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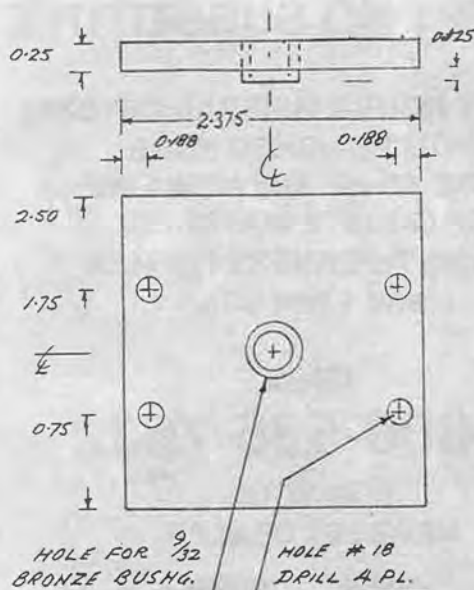
Figure 3. Base plate.

there is no question that if the clock is to run properly for several years, the mainspring has to be cleaned, as otherwise, its power will be markedly reduced by sticky turns which fail to slide easily over each other due to aging grease and oil. In the case of fusee barrels and their master-powerful mainsprings, the question remains of how to do it without rupturing a tendon or two in your priceless fingers or wrists.

If we rule out spring winders and hand extraction, there seems to be only one way left--clean the spring whilst it is still in the barrel. Normally, this can't be done because the concentrated clock soup cannot even enter the barrel in a useful manner when the cover is in place. Removing the cover would not help much either, because the concentrate could not contact the surfaces of the close-packed coils of a let-down mainspring as they lie against the inside of the barrel. So it seems we must take the barrel cover off and then partially wind the mainspring so that there is enough space between its coils to allow the concentrate, and later the rinse, to circulate and so remove all deposits of elderly oil and grease. A worm drive jig which will do just that would appear to be a useful widget to have around.

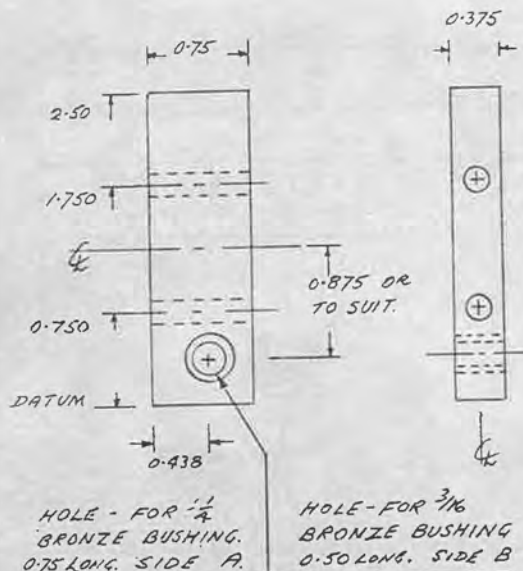
Worm and gear drives, separate or assembled, are available from, say, the Boston Gear Company; however, the thought of paying the full whack for new components has always filled me with horror. Such drives are to be found in surplus mechanical and electronic equipment, and if you have never enjoyed taking apart these intriguing units and storing their goodies for future use, then I'd say you've been doing it all wrong--and you deserve to pay the full whack!

Figure 1 shows the finished product which uses a worm and gear salvaged from surplus equipment together with a few small pieces of 1/4", 3/8", and 1/2" mild steel plate, etc. The



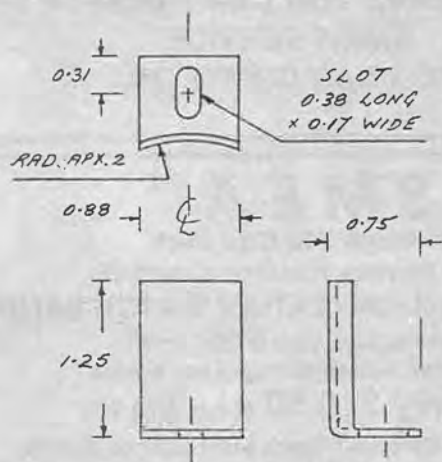
Make 1 of C.R. steel stock 0.25 thick.
All dimensions in inches.

Figure 4. Bottom plate.



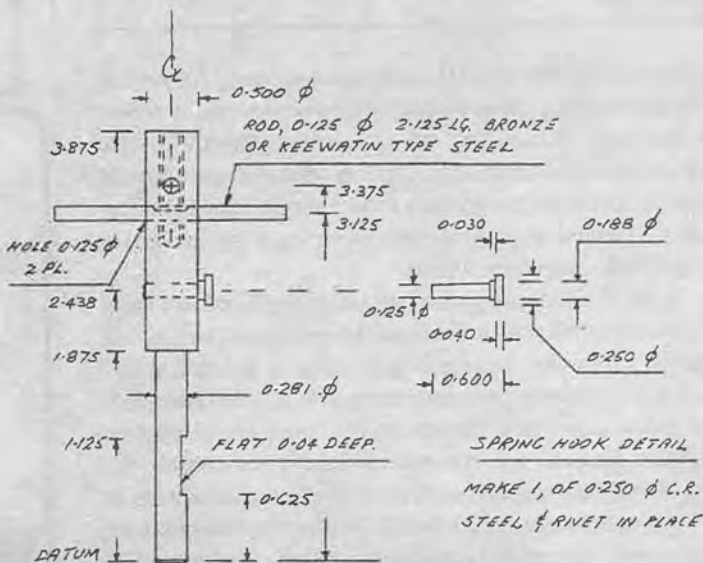
Make 1 Side A; make 1 Side B
of C.R. steel stock $\frac{3}{8}$ " thick.
All dimensions in inches.

Figure 5. Side.



Make 2 of sheet brass 0.063 thick. Form curve around a 2" steel rod. All dimensions in inches.

Figure 6. Bracket.



Make 1 of 0.500 ϕ C.R. steel. All dimensions in inches.

Figure 7. Spring arbor.

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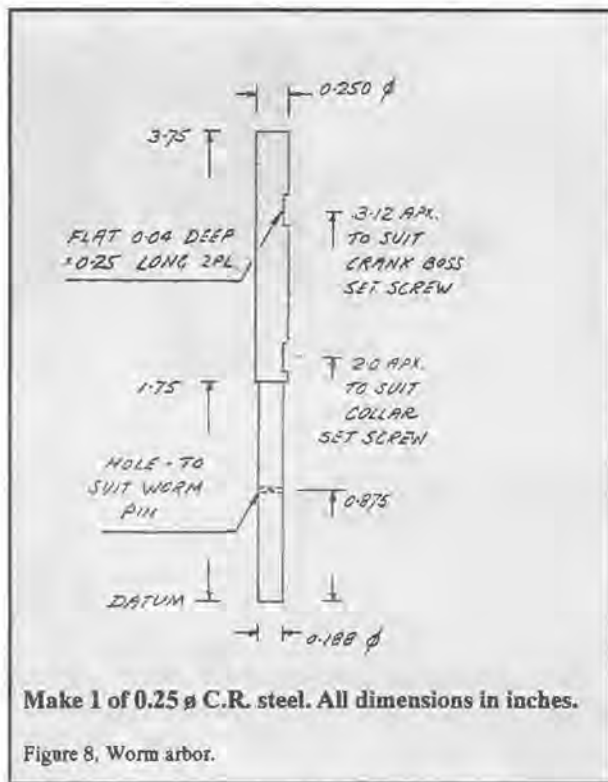


Figure 8, Worm arbor.

1.63" diameter gear has 40 teeth, and the 1/2" diameter worm has a 2-start thread of 10 teeth per inch. This combination gives a 20:1 reduction and, most essentially, a tooth angle which prevents the gear from driving the worm. Figure 2 shows the assembly drawing, and the piece parts are shown in Figures 3 to 8. Typical dimensions are given; however, these may vary a little in order to suit slightly different, but similar drive components which may be available. The finished product must not be too large, of course, or it will not fit into the cleaning machine.

The general idea is to set the worm drive so that, say, the inner third or half of the spring's coils open up for cleaning, rinsing, and inspection, and then to wind the spring up tighter and repeat the process, either once or twice, so as to deal with the whole spring in two or three steps. As the whole jig is immersed in concentrate and rinse each time, it is as well to oil its bearings and the worm itself to replace the oil which is lost at each dip.

The clock's fusee barrel arbor is replaced by the jig's arbor, which is then fed through the top bearing of the jig, the worm gear, and the bottom bearing. The barrel is then clamped between the two adjustable side brackets by means of a surrounding gear clamp. The cross rod, which has two fitting positions in the winding arbor, has a small central flat on which bears the set screw which holds it in place. The set screw lives at the top of the jig's winding arbor (Figure 7). The two holes (fitting positions) in the arbor enable the acceptance of different heights of barrel; the setting of the gear on the arbor provides the necessary fine height adjustment. The rod must be set down until it either almost touches, or even enters, the barrel, as its purpose is to stop a partially wound mainspring from suddenly leaping out to explore your eye socket.

As the initial exiting power of the spring is relatively weak, the rod is sufficient to hold it in place. As it is quite narrow, however, the rod does not impede the flow of concentrate or rinse; neither does it interfere with visibility. As fusee

arbors are typically 0.32"Ø or 0.29"Ø, I chose 0.282" (9/32") as a suitable diameter for the jig's arbor. The arbor's spring hook is mushroom-shaped and circular to enable clockwise or anti-clockwise winding, according to need.

Variations in barrel diameter (Ø) are dealt with by moving the brass brackets in or out, via their slotted holes. Tightening the gear clamp around both brackets and the barrel then secures the barrel to the jig and prevents it from turning during winding operations. The jig's two bearings hold the arbor centered and so permit the barrel cover to be removed and left off for winding and let-down. The spacers, collars, and/or long bushings on the worm arbor (Figure 2) are essential to prevent the worm and its arbor from sliding and so releasing the spring tension and damaging the worm and gear.

When correctly set up, with all set screws, etc. tightened down firmly, the jig works well in practice and is easy to use. However, no responsibility can be accepted by either the author or the American Watchmakers-Clockmakers Institute for injury or damage which may result in its use, particularly to any short-cut artist who fails to use reasonable care and precautions, like, say, omitting to fit or secure the cross rod. Fusee mainsprings are not things to be taken lightly; if their power is not respected, they are always ready, willing, and very able to swiftly demonstrate that, one way or another, they are critters to be reckoned with.

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The Dearborn NAWCC Show

This last NAWCC show in Dearborn, Michigan showed a new direction in the watch market. Dealers came from all over the United States anticipating higher prices because of the weakness in the dollar against other currency. The Europeans came in number for the same reason hoping to pick up some bargains to offset the higher-priced watches they already had. As it turned out, the Europeans wouldn't pay any more for watches even though they came out way ahead in the exchange rate. They cited high inventories and declining sales as reasons. The economy over in Europe doesn't seem to be much better than ours, according to the European dealers. None of these dealers were buying watches which were priced slightly high, so their reasons must have been legitimate.

Because of the International Wristwatch Collectors show starting five days before the NAWCC show, few of the foreign buyers stayed around for the second show. The dealers who did stay around have enormous overhead because of the extra hotel and meal bills. The length of the two shows together is getting to be a big problem for dealers like myself, who also have a business to run. All these factors tied together left many dealers disappointed in one way or another.

The watch business is tougher than it used to be in many other ways. We have had members of the NAWCC shot in their own stores. Others have been robbed either going to or coming back from a show. Two years ago, the Florida show was moved to Miami, and there were many dealers assaulted and robbed right in the hotel where the show was.

Now we have a *new* problem. During this last show, one member had all of his watches and money seized at the airport after he went through the metal detectors because they assumed it was drug money or something else illegal. He had to pay his lawyer to get on a plane and fly to Dearborn to straighten out the mess.

One of the good aspects of the show is filling all your orders for obsolete parts at the show. One of the Europeans brought over a few brand new complete Cartier movements. He had manual wind, automatic, and quartz movements. I bought the model 81 quartz movement for \$125.00. This was one item on my list I never expected to fill at the show. There were for sale, as usual, many brand new Rolex dials of all different colors and styles, including diamond dials. I can usually find Rolex bezel inserts and crystals from someone at the shows.

For trade watchmakers or clockmakers, these shows are the best source of repair parts available anywhere. After going to several shows, you learn who has certain types of parts and what other people are looking for. Don't expect to join the NAWCC and find all the obsolete parts at your first show. I had an Illinois thin model Illini that I needed a mainspring barrel for. It was two years before I ran across an inexpensive partial movement at the shows. The Cartier quartz movement I found at this show was just ordered from me last week, and I told my customer that I probably wouldn't find one; he was very surprised when I called him to tell him that I *did*.

As usual, there was one booth at the show where a dealer fits original glass crystals to your bezel. He has quite an assortment of even the old high bulls'-eye crystals for fusee watches.

Another one of the bright spots of the NAWCC shows are the many used tools that are available. Many expensive lathe accessories can be picked up at bargain prices when compared to today's prices. Crown chucks, bow millers, and other hard-to-get tools are also available.

The number one reason for going to the shows is the selection of watches and clocks for sale. Everyone can find something they can't live without. In a way, I liked the prices being down a lot because I went to the show mostly to buy rather than sell. If you went to the show looking for watches in the

\$20,000 range and up, then you could get bargains compared to three years ago. After the Patek Philippe sale in 1989, men's round button chronograph watches were selling for \$65,000. At this show, one was priced around \$30,000 and finally sold. Because this is a watch usually aimed at the European market, I think the price will drop even more when and if the dollar gets stronger again. Big expensive rare watches are very hard to sell right now unless they are sold at 20-50% off of the prices being realized just three years ago. Even at these lower prices, I wouldn't recommend buying these for investment.

The hottest watch at the Michigan show seemed to be Rolex. The demand for Rolex bubble-backs was still strong, along with all the modern Rolexes. One reason for the stronger prices on the modern Rolexes was the price increase that took effect on September 1st. I think Rolex raised all prices at least 10%. This seemed to pull up the prices on used Rolexes also. Rolex chronographs were still strong at the show. Vintage Pateks seemed to be gaining steam again, but the modern Pateks without second hands weren't moving at all. Gruen doctors watches and curvexes were still strong. Bulova Spaceviews and Swatch watches were dead. Omega Constellations were still being asked for by many people at the show, but the Seamasters weren't.

Several wristwatch dealers approached me and asked for good pocket watches. The diamond dial watches from the 1940s were selling, while the 1960s diamond dial watches weren't. Illinois wristwatches were still strong. There is a premium being paid for fancy design cases with original porcelain Illinois dials. Common gold-filled watches weren't moving very well in wristwatches. Rolex material was a strong mover at the show.

In general, the shows are getting tougher, and there is more theft in the shows themselves. There weren't any problems at this particular show that I was aware of, but at most of the recent shows there have been problems. It's risky bringing watches to and from the show, along with the money.

These shows are still the biggest and best in the world for watch and clock dealers and collectors.

It's very exciting to find that watch you have been looking for to fill out or add to your collection. I urge all watchmakers and clockmakers to consider joining NAWCC just to add another source for parts to their present ones.

□

AWI PARTICIPATES IN FTC WATCH INDUSTRY GUIDES REVIEW

At the request of the Federal Trade Commission, AWI has joined other facets of the jewelry industry to review and make recommendations on proposed amendments to jewelry industry guides. While the review covers the entire jewelry industry, AWI focused its attention on the guides for the watch industry. The recommendations we made will be reviewed by the FTC along with other recommendations it may have received. The guides for the watch industry deal with such topics as:

- *Quality standards of cases and attachments
- *Misrepresentation as to durability or suitability
- *Misrepresentation of protective features
- *Deception as to jewels
- *Deceptive pricing
- *Guarantees, warranties, etc.
- *Country of origin

AWI's input the last time these guides were amended in 1970 influenced such specific areas as deceptive jewel claims, shock protective claims, water-proof/water resistant claims, and labeling as to country of origin.

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As instructors of clock and watch repair courses, our responsibility is to assure that we continue to produce the highest quality instruction possible. In an effort to comply with this standard of excellence, it is necessary for us to continually be aware of the shifting needs of students as well as the progressive changes in our field.

At Winter Park Adult Vocational Center in Winter Park, FL, our staff is engaged in an ongoing program evaluation that is intended to provide concrete information which is used:

- 1) to avoid stagnation, self-complacency, and self-serving attitudes which often follow on the heels of success;
- 2) to be bold enough to initiate innovative changes which may involve risk, and the willingness to use the results for developing effective alternatives.

Working according to this standard has produced some major changes for us.

It became obvious that the goals of students were becoming more and more diverse. Students new to the field had been our primary focus, and teaching was tailored to the needs of beginners. More recently we saw an increase in self-taught or previously employed clock and watch repair personnel returning to the classroom to upgrade their skills. The study of this phenomenon resulted in a two-pronged approach that would accommodate itself to the goals and interests of every student. The students applying to our school are now placed in one of two categories:

- 1) "Job Prep" -- designating the beginner to the field;
- 2) "Supplemental" -- the person who comes to the school to upgrade his/her skills and/or become more proficient in a particular area of expertise.

When the student enters our program, the instructor and individual student meet to agree on a goal of achievement and performance, and *together* establish the areas where further training is required. The instructors work very closely with students to vitalize their skills so that they will return to the field with a higher level of competency. Some students with prior experience in the field find this re-entry a totally different initiation because improved skills frequently result in improved self-esteem stemming from confidence and knowledge. As the student progresses, there are a number of evaluations which serve as a permanent record of his/her progress. In addition, evaluations are used as tools for improving performance and provide motivational incentives. A clear idea of weak points is established. This process also improves the bonding of instructor to student and results in a mentor/

apprenticeship relationship, planting the seeds for the student to experience the practicum from a more secure vantage point.

Using this approach, instructors are better able to fulfill the ultimate goal of engaging the students' awareness and consciousness of the broader demands of the field. It sets the stage to make the jump from the tunnel-vision of a novice to the deeper dimensions of the professional craftsman. Accomplishing the latter is considered a basic, integral program function.

The student's "rite of passage" is more than the sum total of his or her skills and accomplishments. It is necessary to establish a rapport between the aspiring professional and the field of his or her choice. To facilitate this process, emphasis is placed on the history of clock- and watchmaking, past and present trends, and changes in the field of horology. They are made aware of the importance of investing time and membership in our professional organizations at the local, state, and national levels. They learn the value of networking with other professionals and using the system to keep abreast of new technologies. In other words, the student's growth is derived from a hands-on practical approach wedded to a strong philosophical base from which to advance personally and professionally.

The instructors in this environment feel the urgency of influencing young people to enter this honorable and "time-tested" profession. Look around you! You will see that most of us are in the over-fifty age group. Like our predecessors, we need replacement parts. Replacements must be chosen, honed, and tooled properly to be effective.

Yet schools are still closing. The salaries of our profession are rising, but must continue to an acceptable level to keep a flow of young blood coming into the profession. With the help of clock and watch organizations making strong efforts to promote the profession, the field should receive the boost it deserves. The word needs to get out! Our survival depends on attracting new talent to take our places as we leave the field.

As clock- and watchmakers, you are urged to be open to any new challenges, do only quality work, and be proud of the heritage that is ours. Our ethics must be of the highest caliber to engender credibility and consumer trust.

Your ideas and insights are important to us. Please feel free to share them with us. For information about programs or our school, contact: **Tom Bransford, Winter Park Adult Vocational Center, 2250 Lee Rd., Winter Park, FL 32789; (407) 647-6366, ext. 253.** □

Book Review

LES BROCOT UNE DYNASTIE D'HORLOGERS by Richard Chavigny. Hard covers, 224 pages, 129 illustrations. Published by Editions, Antoine Simonin, Neuchatel, 1991.

The Brocot family of clockmakers operated throughout the 19th century and made indelible advances in French clockmaking, both technical and aesthetical.

The Brocot escapement, with its "D"-shaped pallets, not only was considered an improvement in performance, but its very appearance was so inviting that it was advanced from between the plates to be visible in front of the dial. This was copied by almost every Connecticut clockmaker, and today it is known as the "visible escapement." The Brocot escapement, as it is known, was easily identified, as was the Brocot pendulum suspension and regulating bracket, which allowed adjustment for fast or slow from a slight extension above the figure 12 of the dial.

Louis Gabriel Brocot, the founder of this dynasty, arrived in Paris early in the 19th century. This family of clockmakers was ingenious and responsible for many innovations found in the "Pendule de Paris," those round, sturdy, generally trouble-free clock movements.

The Brocot perpetual calendar system incorporated in their clocks today brings good prices, when years ago their size and weight made weak competitive bidding at auctions--a bargain to the knowledgeable collector.

Some details of the Brocots are available in Thorpe's book on the *French Marble Clock*. This new, detailed and authentic, French language edition by Richard Chavigny, editor of the *French Bulletin of the Association Nationale des Collectionneurs et Amateurs d'Horlogerie Ancienne* (ANCAHA) should make research, repairs, and appreciation of these clocks rewarding reading.

The details of the various patents, shown in this new volume, are accompanied by reproductions of the patents, drawings of the many different devices, addresses, and dates in which each of the three main Brocots held sway. The photographs of the various clocks and devices attributed to the Brocots are shown in drawings and very clear photographs.

Those who can find an early clock by the founder of the dynasty, Louis Gabriel Brocot's two escape-wheeled, one-triangular pallet clock, are fortunate indeed. Louis Gabriel patented the popular form of escapement in 1841. Louis Gabriel worked from the 1820s until 1850. Achille Brocot, too, was quite inventive, recording patents in 1847, 1849, 1851, 1852, another that year, 1853, 1861, two in 1863, another in 1865. Antoine Gabriel obtained his first patent in 1858, another in 1863, and another for

NOTE: The book "This Old Clock" by David Goodman was featured in the August '92 HT on page 24 and was listed for \$10.00. The correct price is \$12.00, and the book is available from David Goodman, 220-78 77th Avenue, Hollis Hills, NY 11364.

suspension systems in 1866. These range from suspensions to calendric and alarms, escapements, and striking arrangements. Between them, 19 patents were obtained by members of this dynasty.

The many photographs are clear and reveal the details involved. Photographs are also included which show the residences, factories, geneological charts, history, details of these patents, including the perpetual calendar devices, and one which includes an equation-of-time device. Contemporary engravings picture situations of their time. There are 31 pages devoted alone to suspension systems; 25 pages describe and picture various escapements and their details; and 36 pages describe the various calendric systems, mainly those by Achilles Brocot.

Striking clocks and their mechanisms are equally exposed to study and observation of their different types. A comprehensive chapter contains isometric drawings, photographs, and text explaining their differences. Both count-wheel and rack and snail striking systems are covered in detail. Some contributions by Honore Pons are included.

An "Annex" at the end of the book deals with various wheel counts with a great many examples. A final chapter is a reprint of the Universal Exposition of 1867 and a listing of the awards and grades granted. Some names mentioned here are Poole, Patek Philippe, Ekegren, Grandjean, Dent, Des Fontaines, Lepaute, Oudin, Wagner, and many others. The book contains an adequate index.

Although this informative book is printed in the French language, those interested in this family of inventive clockmakers should be able to pick enough information to more than reward delving into the French text.

Henry B. Fried

□

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A few years ago I hired some extra help around Christmas time. I conducted a short sales meeting, or "pep talk," if you prefer. I told them that we had over two million dollars worth of merchandise to sell. So that they wouldn't think I was a liar, I explained that we have a lot of stock and catalogs which contain lots of merchandise which we can sell. As you know by now, I was just making a point. It is a good point to remember; we *DO* have a large stock available to help us create those special sales.

Case in point: Several years ago a gentleman came into my store and said he wanted to buy a 1-1/2 carat diamond. (Remember, this was many years ago when a 1-1/2 carat diamond was a very large sale, especially for a small independent merchant.) Incidentally, it is important to my story for you to know the appearance of this customer, or I should say my potential customer. He was dressed in overalls and did not look as if he could afford any more than a spring bar.

Having graduated from the usual watchmakers school of hard knocks, and not having any real selling training, I proceeded as follows. I told him that I appreciated him coming in, but I did not have any 1-1/2 carat diamonds in stock. I told him I would be happy to get a memorandum selection to show him which would take 3 or 4 days, if that would be all right. He said yes, so I took his name and phone number. Four days later I was closing this very nice sale. It amounted to quite a lot of money which my new customer paid in cash.



"THE REST OF THE STORY"

It is nice to make large sales and it's a plus when we are lucky enough to sell from an empty wagon, but this is not the reason that I am telling you this story. "This is the rest of the story."

Two months after this sale, my customer, Bruce (you see, we were now on a first name basis), stopped in and bought a few things. Before leaving, he asked if I would like to know why he made his big diamond purchase from me. Naturally, I said yes, I would really like to know why *WE* made this sale. He said that before coming to my store he had approached a clerk in another store and asked to see a 1-1/2 carat diamond. The clerk said, "I guess you know they cost a lot of money." Then Bruce said he told that clerk, as he was turning to walk out, "Yes, I know, and I have lots of money."

DON'T TALK PRICE FIRST

I made that sale by not talking price first. I should not really brag about this sale because I really made it by default. The other store lost that sale by saying the wrong thing which touched a sore spot. Also, I was

lucky that he did not need the diamond the same day; sometimes it is difficult to sell from an empty wagon.

THE ADD-ON SALE

Later, Bruce came back to add some side diamonds to this diamond ring. He wanted to add one diamond on each side of the engagement ring and make a wedding ring to match with four diamonds. So in addition to the original sale, I was making another nice sale. I say "nice" because he wanted these diamonds to be 1/3 carat each. He also wanted each one set in a miracle style. At this point we could have said these diamonds would not fit across the finger with miracle style settings. We could have suggested using smaller diamonds or prong settings, but this is not what Bruce wanted. We made the rings to hold the diamonds like our customer wanted. He was pleased with these special mountings which overlapped both adjoining fingers. We did not say it could not be done or I'm sure he would have walked out and found someone else to do this job. Instead, we figured a way of again satisfying our customer and making more sales to him.

As we said before, we should not talk price first. However, if a customer points to a watch (for instance) and says, "How much is that one?", as we bring the watch up to show, we answer, "This one is \$150." Of course, we want to answer our customer when they ask the price, but don't dwell on it. (Actually we are glad to tell them the price if they ask; their actions afterwards will guide us to continue to show the right price range without saying anything.)

We might briefly say, "This not only tells time and date, but it also has the stopwatch feature." Then we might add, "Is this the type you had in mind?" Notice, we did not say, "Is this the price you had in mind?" We also didn't apologize for the price. In fact, if we just pause for a moment and watch and listen to the customer, he or she will tell us if this price range is all right.

I will always remember the sale to Bruce as my first big sale. I guess we could conclude by saying our overall business with Bruce was good because we OVERLOOKED his OVERALLS. We did not prejudge his ability to make a large purchase by the way he was dressed, and we did not talk price first.

By using good salesmanship, we won't let that "big one" get away. □

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Watch Repair Trainings since 1938. 108 Bartlett Street, Room 214, San Francisco, CA 94110. To speak with the Instructor: Voice Mail (415) 731-0621. When writing for information: CCSF Watch Repair Instructor, 2425 Yorba Street, San Francisco, CA 94116.

BOOKS

JUST PUBLISHED! *Seth Thomas Times Four*, new booklet by Steven G. Conover. Covers 30-hour OG, No. 89, No. 120, and old ship's bell movement. Size 5-1/2 x 8-1/2", 32 pages, \$3.95 postpaid. Order only from Clockmakers Newsletter, 203 John Glenn Ave., Reading, PA 19607. PA residents only, add 6% tax.

Clockmakers Newsletter Special Offer: With your payment of \$34 for a new one-year subscription, choose a free bonus issue on "How to Make a Lantern Pinion." Also in stock: *Chime Clock Repair*, 210-page hardcover book by Steven G. Conover, \$28.50 postpaid. PA residents add 6% tax. *Clockmakers Newsletter*, 203 John Glenn Ave., Reading, PA 19607.

HELP WANTED

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WATCH/CLOCK REPAIRMAN - Experience required, mechanical and quartz movements and high-end manufacturers. Position open, excellent working conditions, medical benefits, profit sharing, paid vacation. Send resume to: T. Cummings, 333 Fort, Port Huron, MI 48060.

Experienced watchmaker in fine mechanical and quartz watches. (212) 696-1881, ask for Lenore.

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High-grade watchmaker looking for position in pleasant working environment. Certified Rolex and Quartz. Can repair all makes and models. Very good with customers. Prefer southeast USA but will consider all offers. Contact: Robert L. Vierra, 203 Baker St., Chattanooga, TN 37405; (615) 265-3105.

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Repeater wristwatch any condition, also WWII wrist or pockets, pre-1960 Rolex case or parts. Hansen, 6605 Argent, Pasco, WA 99301; (509) 545-9929.

Old watch advertising, motorized displays, 1960 and earlier. Hamilton, Longines, Omega, Rolex, etc. Will pay up to \$300 each. Dean Sarnelle, 25 West Beverley St., Staunton, VA 24401; (703) 885-6064.

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WANTED: Original Rolex Easy Oyster Opener, will pay up to \$500.00. We buy Rolex parts, movements, dials, bands, etc. We also buy watchmakers tools, equipment, parts, movements, or complete collections of watches. **WATCHES ETC.**, 5934 NW 39th, Oklahoma City, OK 73122; (405) 789-2824.

HAMILTON WATCH COMPANY catalogs and advertising materials wanted, 1930s to 1960s. Need catalogs, displays, postcards, advertising, radio ad recordings, anything used in selling Hamilton watches. Rene Rondeau, 120 Harbor Drive, Corte Madera, CA 94925; (415) 924-6534, Fax (415) 924-8423.

WANTED: Chronograph movements, will pay: Valjoux 69, \$300; Valjoux 88, \$200; Valjoux 72C, \$100; Valjoux 72, \$75; Movado 95, \$250; Longines 13ZN, \$250; Venus 179-189-190, \$500. Also, Rolex N-A movements up to \$250, Hamilton Model 21 boxes complete \$500, Hamilton Model 22 boxes complete \$300. Dean Sarnelle, 25 West Beverley St., Staunton, VA 24401; (703) 885-6064.

We pay 97% of market for karat gold scrap (any amount)! Also, buy filings, gold fill, sweeps, silver, platinum! Immediate 24-hour payment return mail! Ship insured/registered mail to: **AMERICAN METALS COMPANY**, 253 King St., Dept. HT, Charleston, SC 29401. Established 1960. Phone (803) 722-2073.

To place a classified ad write to:
Horological Times

P.O. Box 11011, Cincinnati, OH 45211

Or for more information call:
(513) 661-3838

Dates to Remember

OCTOBER 1992

3-4--Watchmakers Association of Pennsylvania Annual Convention, Penn State University Campus, State College, PA.

5-9--Quartz II, AWI Project Extend, Robert Bishop, instructor; Cincinnati, OH.*

10-11--Repair of the Atmos Clock Bench Course (AWI); Gerald Jaeger, instructor; Seattle, WA.* (THIS COURSE IS FULL)

10-11--Introduction to Clock Repair Bench Course (AWI); Buddy Carpenter, instructor; Richmond, VA.* (THIS COURSE IS FULL)

11--Servicing ETA Quartz Chronographs Bench Course (AWI); James Broughton, instructor; Lake Worth, FL.*

11--Watchmakers Association of Ohio Auction, American Legion Hall, Southway Post 144, 3253 South High St., Columbus, OH, 12 noon. For more information contact Karl Farnlacher, Dayton, OH, (513) 275-3172.

12-16--Quartz III, AWI Project Extend, Alice Carpenter, instructor; Cincinnati, OH.*

17-18--Cuckoo Clock Repair Bench Course (AWI); James Williams, instructor; Los Angeles, CA.* (THIS COURSE IS FULL)

19-23--Clock Repair I, AWI Project Extend, James LaChapelle, instructor; Cincinnati, OH.*

23-25--Florida State Watchmakers Association Annual Convention, Howard Johnson Hotel, Daytona Beach, FL.

23-25--Illinois Watchmakers 16th Annual Convention, Keller Convention Center, Effingham, IL.

26-30--Clock Repair II, AWI Project Extend, Roland Iverson, instructor; Cincinnati, OH.*

31-Nov. 1--Repair of the Atmos Clock Bench Course (AWI); Gerald Jaeger, instructor; New York, NY.

NOVEMBER 1992

7--Watchmakers Association of New Jersey's Annual Dinner Dance, San Carlos Restaurant, Lyndhurst, NJ. For more information contact the Watchmakers Association of New Jersey, 368 Clover Lane, Wyckoff, NJ 07481.

8--Servicing ETA Quartz Chronographs Bench Course (AWI); James Broughton, instructor; Houston, TX.*

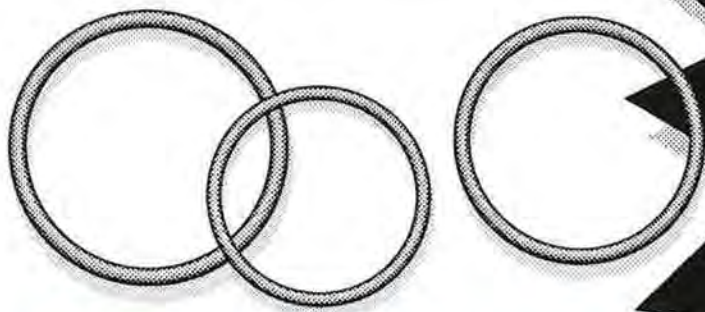
FEBRUARY 1993

13-14--Advanced Quartz Watch Repair Bench Course (AWI); Robert Bishop, instructor; San Diego, CA.*

***For more information on AWI Bench Courses, Project Extend, and Regional Seminars, contact AWI Central, P.O. Box 11011, 3700 Harrison Avenue, Cincinnati, OH 45211; (513) 661-3838; Fax (513) 661-3131.**

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40-1250	.40	12.50	13.30	60-3380	.60	33.80	35.00	80-2760	.80	27.60	29.20
40-1400	.40	14.00	14.80	70-1740	.70	17.40	18.80	80-2840	.80	28.40	30.00
40-1500	.40	15.00	15.80	70-1850	.70	18.50	19.90	80-2900	.80	29.00	30.60
40-1600	.40	16.00	16.80	70-1890	.70	18.90	20.30	80-2915	.80	29.15	30.75
40-1700	.40	17.00	17.80	70-1925	.70	19.25	20.65	80-2930	.80	29.30	30.90
40-1900	.40	19.00	19.80	70-1960	.70	19.60	21.00	80-2960	.80	29.60	31.20
40-2300	.40	23.00	23.80	70-1980	.70	19.80	22.20	80-3000	.80	30.00	31.60
40-2700	.40	27.00	27.80	70-2080	.70	20.80	22.20	80-3060	.80	30.60	32.20
40-2780	.40	27.80	28.60	70-2130	.70	21.30	22.70	80-3070	.80	30.70	32.30
40-2800	.40	28.00	28.80	70-2300	.70	23.00	24.40	80-3130	.80	31.30	32.90
40-2900	.40	29.00	29.80	70-2460	.70	24.60	26.00	80-3160	.80	31.60	33.20
40-3000	.40	30.00	30.80	70-2500	.70	25.00	26.40	80-3240	.80	32.40	34.00
40-3070	.40	30.70	31.50	70-2660	.70	26.60	28.00	80-3300	.80	33.00	34.60
45-0810	.45	8.10	9.00	70-2700	.70	27.00	28.40	85-2940	.85	29.40	31.10
50-1650	.50	16.50	17.50	70-2750	.70	27.50	28.90	90-1850	.90	18.50	20.30
50-1750	.50	17.50	18.50	70-2780	.70	27.80	29.20	90-1860	.90	18.60	20.40
50-2020	.50	20.20	21.20	70-2850	.70	28.50	29.90	90-1900	.90	19.00	20.80
50-2070	.50	20.70	21.70	70-2900	.70	29.00	30.40	90-1920	.90	19.20	21.00
50-2200	.50	22.00	23.00	70-2940	.70	29.40	30.80	90-2060	.90	20.60	22.40
50-2400	.50	24.00	25.00	70-2980	.70	29.80	31.20	90-2130	.90	21.30	23.10
50-2500	.50	25.00	26.00	70-3000	.70	30.00	31.40	90-2220	.90	22.20	24.00
50-2600	.50	26.00	27.00	70-3020	.70	30.20	31.60	90-2510	.90	25.10	26.90
50-2700	.50	27.00	28.00	70-3060	.70	30.60	32.00	90-2840	.90	28.40	30.20
50-2800	.50	28.00	29.00	70-3140	.70	31.40	32.80	90-2860	.90	28.60	30.40
50-2850	.50	28.50	29.50	70-3180	.70	31.80	33.20	90-2890	.90	28.90	30.70
50-2900	.50	29.00	30.00	75-1660	.75	16.60	18.10	90-3000	.90	30.00	31.80
50-3000	.50	30.00	31.00	75-1885	.75	18.85	20.35	90-3020	.90	30.20	32.00
50-3100	.50	31.00	32.00	75-1920	.75	19.20	20.70	90-3060	.90	30.60	32.40
50-3200	.50	32.00	33.00	75-2300	.75	23.00	24.50	90-3100	.90	31.00	32.80
50-3300	.50	33.00	34.00	75-2600	.75	26.00	27.50	90-3180	.90	31.80	33.60
55-1790	.55	17.90	19.00	75-2740	.75	27.40	28.90	100-1900	1.00	19.00	21.00
60-1000	.60	10.00	11.20	75-2790	.75	27.90	29.40	100-2600	1.00	26.00	28.00
60-1750	.60	17.50	18.70	75-2880	.75	28.80	30.30	100-2750	1.00	27.50	29.50
60-1980	.60	19.80	21.00	75-2910	.75	29.10	30.50	100-2900	1.00	29.00	31.00
60-2100	.60	21.00	22.20	75-2930	.75	29.30	30.80	100-2950	1.00	29.50	31.50
60-2165	.60	21.65	22.85	75-2970	.75	29.70	31.20	100-2975	1.00	29.75	31.75
60-2450	.60	24.50	25.70	75-3000	.75	30.00	31.50	100-3000	1.00	30.00	32.00
60-2500	.60	25.00	26.20	75-3065	.75	30.65	32.15	100-3060	1.00	30.60	32.60
60-2700	.60	27.00	28.20	75-3100	.75	31.00	32.50	100-3075	1.00	30.75	32.75
60-2890	.60	28.90	30.10	75-3130	.75	31.30	32.80	100-3175	1.00	31.75	33.75
60-2950	.60	29.50	30.70	80-1650	.80	16.50	18.10	100-3200	1.00	32.00	34.00
60-3000	.60	30.00	31.20	80-1675	.80	16.75	18.35	100-3250	1.00	32.50	34.50
60-3080	.60	30.80	32.00	80-1870	.80	18.70	20.30				
60-3185	.60	31.85	33.00	80-2030	.80	20.30	21.90				

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Cincinnati, OH 45211

PLEASE NOTE: Registrations are limited and will be selected by the earliest postmarks. You may register by fax if you wish; if so, please include your Visa or MasterCard number, card expiration date, and signature. **FAX: (513) 661-3131.**
For more information, call **(513) 661-3838.**

OCTOBER 1992

10-11--Repair of the Atmos Clock--Seattle, WA (full)
10-11--Introduction to Clock Repair--Richmond, VA (full)
11*--Servicing ETA Quartz Chronographs--Lake Worth, FL
17-18--Cuckoo Clock Repair--Los Angeles, CA (full)
31-Nov 1--Repair of the Atmos Clock--New York, NY

**If advance registrations warrant, another class will be scheduled on October 10th.*

NOVEMBER 1992

8--Servicing ETA Quartz Chronographs--Houston, TX

FEBRUARY 1993

13-14--Advanced Quartz Watch Repair--San Diego, CA

COURSES & INSTRUCTORS

Introduction to Quartz Watch Repair
Buddy Carpenter, CMC, CMEW
Advanced Quartz Watch Repair
Robert Bishop, CMEW
Introduction to Clock Repair
Buddy Carpenter, CMC, CMEW
Advanced Clock Repair
Roland Iverson, CMC
Repair of the Atmos Clock
Gerald Jaeger, CMW, CMEW, FAWI
Beginning Lathe
James Lubic
Cuckoo Clock Repair
James Williams, CC
400-Day Clock Repair
John A. Nagle
Servicing ETA Quartz Chronographs
James Broughton, CMEW
Remy Waelchli
Advanced Lathe
Roy Hovey
Striking Clocks
John Nagle

PROJECT EXTEND CLASSES FOR 1992

Contact AWI Central for the General Information brochure for Project Extend and specific course brochures for classes that interest you. **AWI Central, P.O. Box 11011, Cincinnati, OH 45211; (513) 661-3838; Fax (513) 661-3131.**

Sept. 28-Oct. 2 **Quartz I** Gerald Jaeger
(an introduction course in quartz watch repair)

Oct. 5-9 **Quartz II** Robert Bishop
(an advanced course in quartz watch repair)

Oct. 12-16

Quartz III Alice Carpenter
(review for and complete the Certified Electronic Master Watchmaker Examination)

Oct. 19-23

Clock Repair I James LaChapelle
(an introduction course)

Oct. 26-30

Clock Repair II Roland Iverson
(an advanced course)