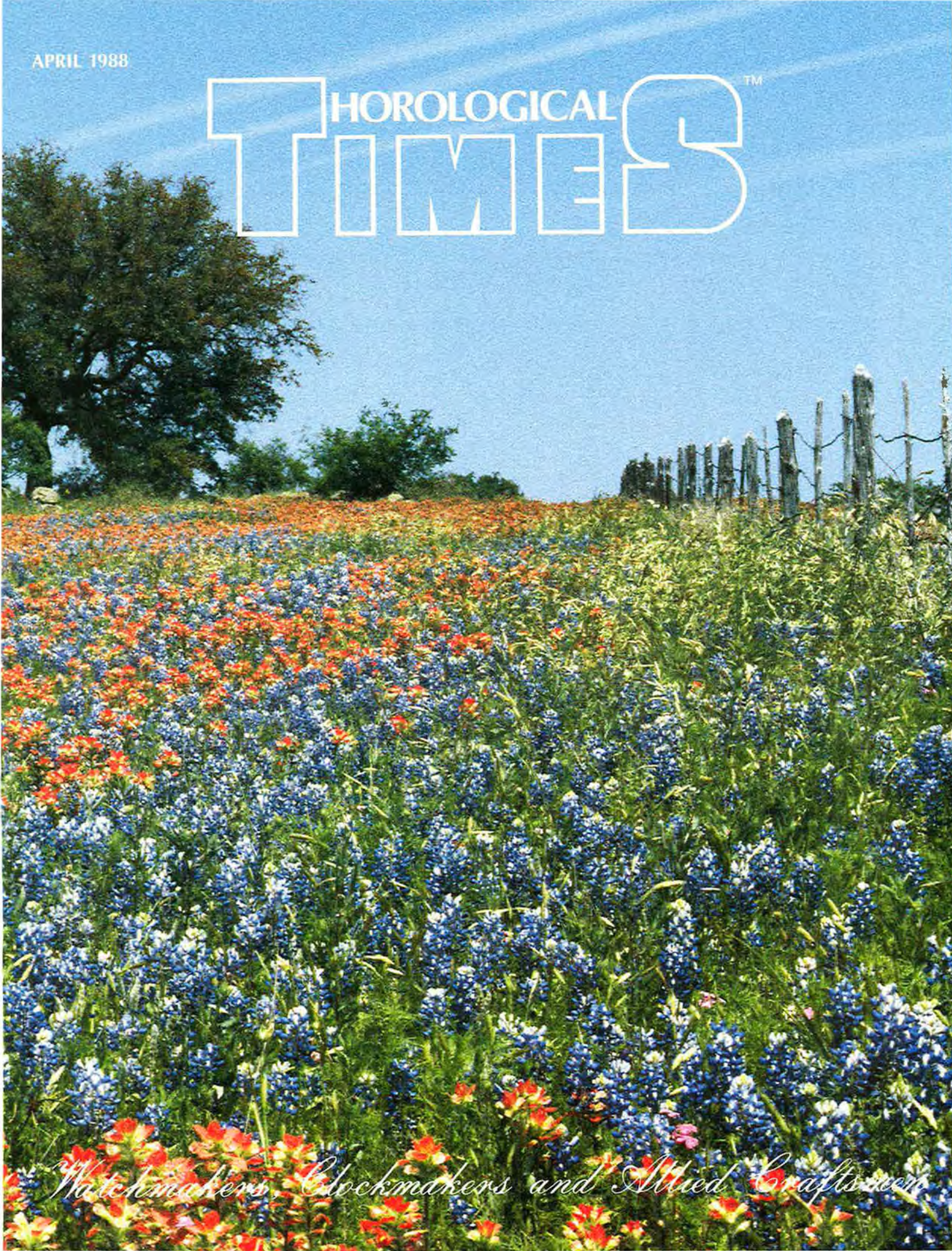
APRIL 1988

HOROLOGICAL TIMES™



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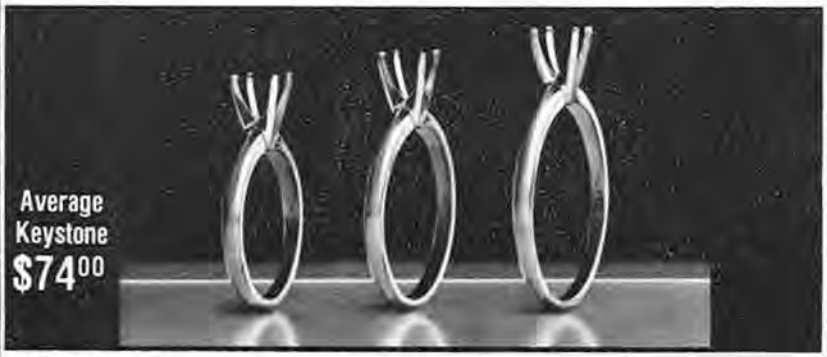

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UP FRONT

EXCLUSIVELY YOURS . . .

36ΔXYZ

What is it? It's your exclusive AWI National Registered Identification Mark.

Ever since AWI adopted the system, each new member has received a card revealing that member's exclusive National Registered Identification Mark. Marks have also been issued to others in the industry who have requested them.

The triangle immediately identifies the mark as being an AWI registered mark; the numerals preceding the triangle identify the State in which the mark's owner lived at the time it was assigned; the alphabetical letters after the triangle identify the mark's owner in AWI's confidential file. There are 52 State identification numbers because we have included the District of Columbia and Puerto Rico.

The mark displayed above is a sample only, and actually identifies no one. If it were not a sample, it would indicate that the individual lived in Ohio at the time of assignment and the "XYZ" would pinpoint the individual in Ohio to which it had been assigned. If you do not remember the number you were assigned when you became an AWI member, a request including a self-addressed, stamped envelope will refresh your memory.

Members who are not in the repair business report they use the mark on their personal property. It's shorter than using your Social Security Number and makes a positive identification of your property when the need arises.

It should be made clear that under no circumstances are identifications made for anyone other than law enforcement agencies, and then only after the legitimacy of their request has been verified. The mark has also aided in the identification of victims in several national disasters. The Identification Mark Committee urges you to know and use your AWI National Registered Identification Mark.

ON THE FRONT: Mr. C.E. Mulholland of Austin, TX is the photographer of this scene, shot near the Highland Lakes area in Central Texas. The two types of flowers in this picture—the Indian Paintbrush and the Texas Bluebonnet—are scattered throughout the area in fields and meadows, heralding in the Spring.

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Moonphase/Calendar Round 18K	Up to $6,000
Calendar 18K	Up to $3,000
Rectangular 18K	Up to $3,000
Square 18K	Up to $1,200
Round 18K	Up to $1,000
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ROLEX

Moonphase/Calendar/Oyster Case 14K	Up to $15,000
Moonphase/Calendar 14K	Up to $12,000
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Chronograph 14K	Up to $7,500
Chronograph Stainless Steel *circa 1950*	Up to $1,500
Daytona Cosmograph 14 or 18K	Up to $5,000
Daytona Cosmograph Stainless Steel	Up to $900
Bubble Back/Hooded Case 14K	Up to $4,000
Bubble Back/Hooded Case Stainless & Gold	Up to $3,000
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There are so many different wrist watch manufacturers and styles that we certainly cannot list all our interests and their prices. However, if you have an interesting wrist watch that is for sale, please call us TOLL FREE today. We are also very interested in purchasing quality American & European pocket watches. Prompt, dependable & confidential transactions have been our trademark for doing business since 1976. We now also have our own private high performance aircraft to facilitate travel.

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President's Message

William Biederman

Potential Danger of Battery Ingestion

Recently AWI Central received a call from the Chicago Poison Center seeking information about the composition of a liquid crystal display unit of a digital watch. The problem was that a youngster had actually swallowed one of the small "stick-on" timepieces.

This was the first time we had received a medical call regarding the liquid crystal digital display unit. In fact, it is the first time we have heard about a complete timepiece being ingested. We were able to determine that the actual liquid crystal material was no threat. However, obviously there was danger if the composition of the display was glass, especially if the glass bacame shattered.

We did point out the potential danger of the battery which had also been consumed by the child. It is not uncommon for AWI Central to receive calls concerning watch batteries that small children have swallowed. In the September 1985 *Horological Times* we featured an article about the research we had done on the subject, after having received a call from our local Children's Hospital. Our research led us to Dr. Toby L. Litovitz at the National Poison Center, Georgetown University Hospital, Washington, DC. Dr. Litovitz had considerable experience with the problem and had established a program to deal with just such emergencies.

Dr. Litovitz reported that in most cases the battery was eliminated in a normal manner in the stool with no adverse affects. The most serious and immediate danger when a child swallows a battery is the danger of whether the battery will clear the esophagus or not. If it does, and if the battery does not get "hung up" or become damaged, it will usually pass normally through the digestive system. It is the possibility of the exception to the norm occurring, that should concern us each time such an incident happens.

Upon learning of a battery ingestion, advise those in charge to call their local Poison Center, or the 24-hour hotline of the National Button Battery Ingestion Center. The number is **202-625-3333.**

Another hazard of letting small children gain access to small (button) batteries is the fact that in many cases they will stuff them in their nose or ears. This usually is easier to deal with, but a call to the "hotline" is also recommended for this situation.

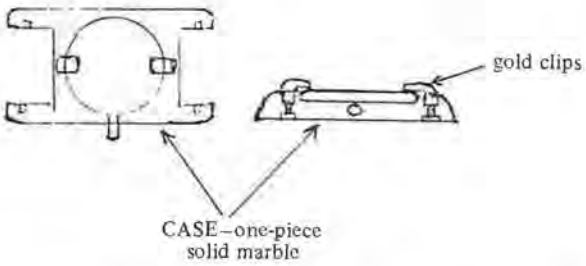
The AWI Public Relations Committee is preparing a public service announcement designed to alert the public to the potential risk of allowing children to gain accesss to these batteries. These announcements are in the form of newspaper slicks which you can distribute to your local papers. They prominently feature the National Poison Center hotline number. The slicks will be available to members, without charge, after May 1. Address your request to: Public Service Announcement (Battery), c/o AWI Central, 3700 Harrison Avenue, Cincinnati, OH 45211. Please enclose a stamped, self-addressed, business-size envelope.

Our Readers Write

A few weeks ago I called you for help—to get into a watch that I had in for repair.

The watch was an Andre Paliet. The case was one piece of what appeared to be red, highly polished marble. The crystal was flat, highly polished quartz. On the dial was 'Andre Paliet,' 'Ruby Star' above the hands. Below the hands was the vacuum and 36000.

As shown by my diagram, the crystal appeared to be held in by two gold clips, each secured by a screw under the leather band. After removing these, I could not get the crystal out. That is when I called you.



You could not find any information on how to get it open. After making several telephone calls, you located the U.S. importer for me. It was Sterlings Jewelers in Dallas (their main distributing office, not one of their retail outlets). I called them and got in contact with their repair center. A gentleman there was very helpful and advised me of the following: The watch was a vacuum-sealed model. It could be opened by removing the dovetailed stem, which would release the vacuum. The crystal could then be removed via a vacuum cup. After the watch is repaired, you put it back together with the crystal resting lightly on its rubber ring and pump a vacuum on it with their special equipment. Leave it in the vacuum two or three minutes and then remove it and install the two gold clips on the crystal.

I did not have their special equipment for this watch; possibly my experience will help someone else.

After removing the dovetail stem to release the vacuum, I could not remove the crystal with a small vacuum cup. It turned out that the crystal was stuck to the rubber gasket. After some deliberation, I decided to apply compressed air to the stem opening. This readily blew the crystal out into my hand.

After the movement was repaired (it was an autowind, day, date movement), I was faced with finding a way to get it resealed with a vacuum. I finally hit on the idea that a jeweler friend of mine who does a lot of casting had a vacuum casting machine. He readily agreed to help me, and we placed the watch in his machine and pumped a vacuum on it. I left it in there about three minutes, then took it out and tightened the screw clips on the crystal. Success at last!!

Again I say thank you . . . this more than paid my dues this year!!

Hugh E. Metzler
Mineola, Texas

Questions & Answers

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

J.W. Benson

Q Can you provide me with any information about this watch? It is a J.W. Benson, 58 & 60 Ludgate Hill, London 5197; to HRH the Prince of Wales, and with these trademarks:

Any information will be appreciated.

J.C. Pounder, Jr.
Spokane, WA

A *J.W. Benson was a most successful retailer and maker as well as being an active exporter of watches made by his shop as well as imported (from Switzerland) watches.*

Yours was an English-made watch (Prescott factory) and finished by Benson's watchmakers. The case too is English and was hallmarked in London in 1810 (if your P in the square box is accurately reproduced). Different letter designs of the alphabet reveal different dates. The movement appears much younger, say about 1850.

Benson was also the author of the book "Time and Time Tellers", published in 1875. It was mostly about the products from his shop. Your watch movement appears almost like that shown on page 75 but with a movement balance more advanced.

Q I have a very old self-winding watch for which I would like some historical background. The movement is marked *A. Schild* and there is also the name *Harwood.* The hands are set by turning the bezel on the case, and there is no conventional winding or setting mechanism.

S. Zablin
Philadelphia, PA

A *An Englishman, John Harwood, first developed a practical self-winding watch. Shortly after WWI (about 1922) Harwood produced models which he felt were practical enough to be marketed. This presented a problem because at this point in time watch manufacturing in England was at a low ebb. Harwood turned to Switzerland and found that the A. Schild Co. was willing to take the risk of marketing this revolutionary new device. A. Schild eventually marketed a 15 jewel model which contained an oscillating weight mounted on a center bearing; the weight was restricted on either side by bumper springs which cushioned the impact when the weight hit against them. This particular movement was discontinued about 1931; however, we are all familiar with the many efficient winding systems this first calibre spawned.*

Because the manufacturer wanted to make it obvious that this watch was an automatic, the winding stem and crown were omitted. The hands were set by turning a bezel either clockwise or counterclockwise. A red spot which appeared through a hole in the dial indicated the neutral position in which the bezel was out of gear.

Q Please give me any information on the following watches. The first one is a Eustus Brothers, Minneapolis, MN. This is a 17 ligne Swiss movement in an 18K open face case, hinged back and bezel, movement #24539. A date engraved in back of the case dates 1893. The inside of the cover has a mark: 1 $ 8 – 24339 – 38 and 25 jewels. The case backs have a circular brushed finish.

The second is from Colombier Watch Co., New York, serial #891011-16006. It has a mark like a figure 8 or like two links of a chain. It also has a mark (small) to the left of it, I think it is a #4. This is an 18s, 15j key wind and set. The center wheel is broken and the cannon pinion is gone. The center post is hollow. This is for the pin that goes through for setting hands.

The third watch is a W.E. Avery, Columbia, S.C., 17j, 18s, adjusted, serial #931-965, safety pinion. To me this looks like an Elgin. The dial has the same W.E. Avery name (W.E. Avery R.R.).

William L. Smith
Greenwood, SC

(Please turn to page 8)

QUESTIONS & ANSWERS
(Continued from page 6)

A *Watch No. 1 was probably made by Meylan of Geneva about the turn of this century. The name on the dial is that of the quality jeweler who ordered it. Eustus Brothers are no longer in business in Minneapolis, not at least since 1930 which is as far as I go back in my own listings on the Jewelers Board of Trade Book. These were the first trade finest movements with the Geneva quality stamp on them. I doubt whether this movement had 25 jewels. If the case bears that legend as your note indicates, then I must assume that the case is not the original one.*

Watch No. 2 is a Swiss. The spelling is another way of getting around the law forbidding American-sounding names on Swiss imports. The movement is medium grade, circa 1880, not rare or collectible quality.

Watch No. 3 was made by the Dueber-Hampden Watch Co. of Canton, Ohio very close to 1896. The Dueber Company would put the jewelers names on these watches if enough were bought. Avery was the S.C. jeweler. He was a retail jeweler, then listed at 1619 Main Street in Columbia.

Henry B. Fried

The following question was referred to Archie B. Perkins for an answer.

Q We recently purchased an abused but well equipped Moseley jewelers lathe and we cannot stand to use it without some restoration. Our questions are: What process should we use to replate it? Were they nickle plated and is there anyone who provides this service? Will it affect the working ability of the lathe? We also need to do the cross slide and other precision parts.

Thank you for any help.
Greg McCreight
Lima, OH

A *Your letter regarding the damaged Moseley lathe was forwarded to me for an answer. I will try to answer your questions as well as I can.*

In the first place, it depends on how badly a lathe has become damaged as to whether it can be restored or if it even pays to try to restore it. To replate a lathe, all of the old plating must be removed by a stripping process. Then the lathe is prepared for the new plating process. It is in this preparation process that there is danger of changing the accuracy of the lathe. Therefore, this preparation should be done by a professional who understands precision machinery and how important accuracy is to the particular item being plated. It would be better to have a watchmakers lathe company do the job or maybe a machinery place. The plating should not be done by an automobile bumper plating company because they usually buff the item smooth before plating it. This rounds off the corners and, as a result, the accuracy is lost.

I do not know of anyone that specializes in this type of work for watchmakers lathes. You might write to Derbyshire or Levin to see if they would do this work for you, or try a local machine shop supply house.

The older lathes were usually nickel plated. The old Moseley lathe was nickel plated, but the newer Moseley lathes, made by C & E Marshall Company, were chrome plated. In fact, they had three plates. First, they were copper plated, then nickel plated, and then chrome plated. The Levin lathe is copper plated and then chrome plated. Derbyshire claims that their lathes and attachments are nickel plated, as does Boley.

Sometimes it is better to use the lathe as is unless it is in too bad of a condition to be used or unless you just can't stand to see its bad condition.

I have an old Boley lathe that I bought for $10.00 which I use for my rough work. The plating on this lathe isn't very good, but I live with it instead of having it plated and standing the chance of losing its accuracy.

I hope I have answered your questions; if not, please write me.

Archie B. Perkins

Bench Tips

SEND YOUR TIPS TO: Jingle Joe, AWI Central, 3700 Harrison Avenue, Cincinnati, OH 45211.

Joe Crooks

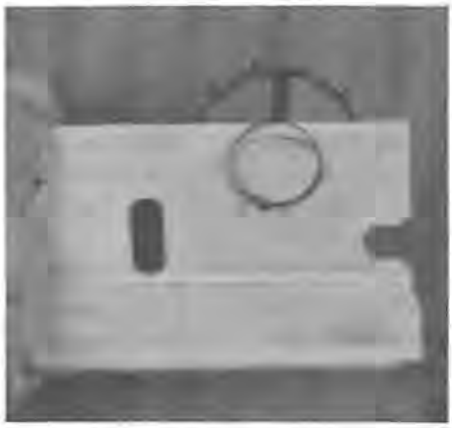
How to Shave the Fuzz from Hairsprings

This month's tip is from C.E. Mulholland of Austin, TX.

Some of my friends laughed when I told them I used a razor blade to untangle hairsprings. The enclosed photos show how it is done.

Figure 1 shows how the razor blade is mounted in Rodico® with the edge of the blade slightly higher than the back or lower edge in the picture. Figures 3 and 4 show this angle of the blade. Figure 2 shows how it is used. The hairspring with the tangle is lifted by its stud and slid over the edge of the blade with the tangle(s) *above* the blade as shown in Figure 2. The spring is then rotated so it will gradually slide over the edge until it will go no farther; that is, until the tangle is at edge. Since the Rodico will adhere to your workbench you are now ready to lift the necessary turns of the spring over the stud using two tweezers. Backing the spring up about 45 degrees makes the tangle easier to see. It also helps to paint the razor blade white. I used model airplane paint. It dries fast and gives a smooth white surface making the coils of the spring easier to see.

I have used this method for over 30 years with very good results since it leaves both hands free. (Before Rodico, I used a bench knife stuck in button pithwood.)



C.E., without your photos I would have thought you were nuts. But with the pictures it's easy to see how a razor blade supported in Rodico will free the other hand to pick out tangles. Better not hiccup when you are sliding in the razor blade though, or you may wind up with two halves of a hairspring.

Just think of the times when you were working a tangle out close to the stud and had to lay it down to wait on a customer. When you get back to the hairspring, some gremlin has zapped the tangle back close to the collet. Makes you want to say "aw shucks," cause the customer probably only wanted you to set their 98 cent Hong Kong digital watch which they were too dumb to set.

Ever tried to explain to one of these so-called customers why a new p/c would cost them 5 bucks? Well, don't even try. Instead, just send them across town to a competitor you don't like, and who you are sure stocks batteries for these nice Hong Kong watches.

CRAFTSMAN'S CORNER

By Bert Dawson

Repairing Costume Jewelry

You can profit from repair work whether the customer leaves it for repair or not. When taking in a job the customer should be told that you will repair it as best you can at her risk, and the store has a minimum charge of $5.00. The customer might say: "That's too expensive. That old earring isn't worth repairing."

She said it, not you! If *you* had told her that it wasn't worth repairing or that you don't repair that kind of jewelry, she may have been insulted and would have never returned again. But instead, she is now a perfect prospect for a sale of a *new* pair of earrings. Keep the conversation positive, and you win both ways. If she leaves the work, you do it at a profit. If she doesn't, you have made a sale. Or at least you have kept the faith and confidence of the customer.

COSTUME JEWELRY AND MISCELLANEOUS REPAIRS

The tools and materials required to repair costume jewelry include a small soldering iron, a small soldering gun, soft solder, soft solder flux, a few assorted pliers, two or three tweezers, findings such as ear clips, safety chains, jump rings, spring rings, bracelet hinges, and an assortment of clasps and fastenings. All of these materials are inexpensive. The more costly silver and gold-filled findings should not generally be used on costume jewelry.

EFFICIENT REPAIRING

A small bench especially equipped for this type of repair work will increase the efficiency of repairing. Having the tools and materials available and ready for use will save time. Setting aside a bench for costume jewelry repair also prevents interference with the shop's regular repair work, which requires different materials and tools.

TRICKY REPAIR PROBLEMS

After trying a few times to cope with the special problems peculiar to repairing costume jewelry, the jeweler will learn a few tricks to make repairs easier. Actually, most jobs seldom take more than five or ten minutes to complete. One of the most difficult jobs encountered is illustrated in Figure 1. Solder will not fuse to some alloys that are used to manufacture costume jewelry. The earring manufactured by a leading costume jewelry manufacturer described here uses this type of alloy.

To replace the ear clip on this earring that could not be soldered, a hole was drilled into the body of the earring at a slant to make the hole as deep as possible (A). A brass pin with a notch cut in it was placed in the hole, and metal from the earring was peened into the notch (indicated by the arrow) to hold the pin in (B). The pin was sawed off short, and some solder was applied to the end of it (C). Solder

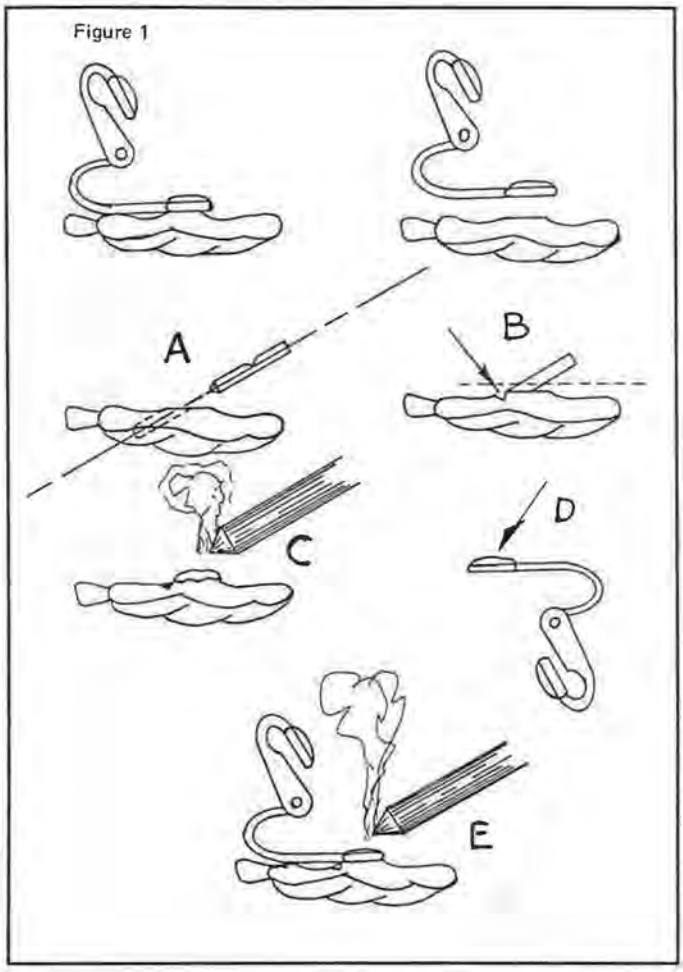
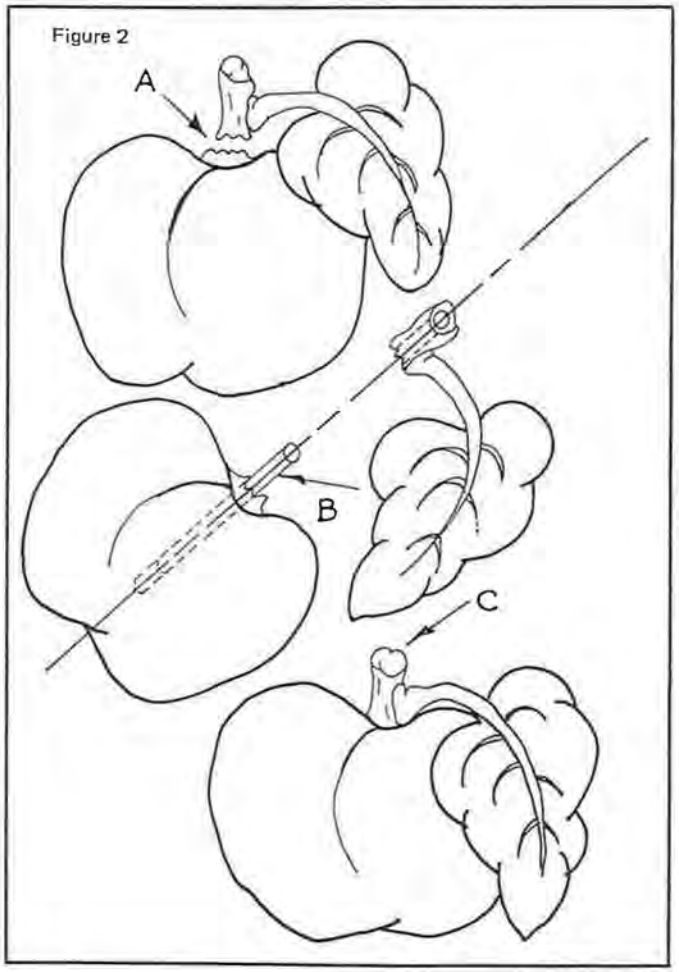


Figure 1

Figure 2



was also applied to the back of the ear clip solder pad (D), and the two parts were soldered together (E). This completed the repair job in just under five minutes.

A SOFT SOLDER JOB PROBLEM

The example illustrated in Figure 2 is a paperweight in the shape of an apple with a stem and a leaf; the stem and the leaf had broken off. The customer wanted it repaired. While this is not a piece of jewelry, it is a high-grade gift item sold by jewelers. This is a typical example of many treasured items the jeweler is asked to repair. Being able to repair such items is not only profitable but builds goodwill for the store as well as making someone happy.

The metal is a lead alloy and weighs about two pounds. It was highly polished, gold-plated and protected with a heavy coating of clear lacquer. Because of the lacquer the apple could not be heated sufficiently to allow the solder to flow without destroying the finish.

The repair was accomplished by drilling a hole in the apple and inserting a brass pin friction tight (B). A hole was also drilled through the stem of the leaf and fitted flush to the apple over the protruding pin. Only the top of the pin was soft soldered to the stem. The solder was painted with gold colored lacquer.

The job took less than 10 minutes and the stem is stronger now than when it was new.

SHOP TALK

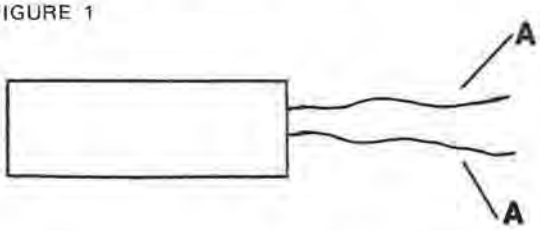
Wes Door, CMW

Oscillating Crystals

What is an oscillating crystal? It's a piece of quartz—thus the term "quartz watch". This quartz is especially cut into a small piece which will vibrate (or oscillate) at a constant frequency. When properly mounted with the energy from the battery and other parts, the frequency will theoretically remain the same. This explanation is over-simplified but will suffice for our purpose.

Remembering that all quartz watches, including LED, LCD, and analogs, have a quartz oscillator; it is important to consider that sometimes this part could need replacing. This oscillator (piece of quartz) is mounted in a canister, as it appears in Figure 1. Althouth it would not be very shock-proof if left unmounted; when mounted inside of a casing (canister) it becomes quite stable. Observe the two lead wires (Figure 1A) extending from this oscillating casing. These wires are soft and can be formed to the shape necessary to "tie-in" with the circuit.

FIGURE 1



Most of these are soldered in place; however, we should observe the method used by the factory and duplicate it, if possible. Some of these are not soldered but instead are just laid in place and when the bridge or plate is replaced, it clamps the oscillator leads to hold them in place. Incidentally, we do not have polarity to worry about as there is no "positive" or "negative"; therefore, either lead wire can be fitted to either spot.

Normally very little bending is necessary to properly fit this new oscillating crystal to the circuit board. Some care is necessary, however, as the wires can be broken and thus lose its contact and it will not work. It is a good rule not to make any sharp bends on these lead wires too close to the casing. Generally these lead wires are too long and the ends must be cut off. Any cutting-type pliers can be used, or even finger nail clipppers. We can use tweezers and break off this extra amount by bending the wire back and forth until it falls off. We must be careful not to break off the wire close to the casing as it will then be necessary to replace this oscillating crystal (even if it is a new one that we are just installing).

PROPER SIZES TO USE

Since oscillator crystals come in a casing (canister) of various sizes, it is important to use a replacement one that will be the same as the original. This is not quite true, as we can actually use any size that will physically fit properly. In most cases we should use the same as the original to do a professional job; however, one that is smaller and still looks nice may be used. This substitution should only be made if we can properly secure this new oscillator so it will not flop around or otherwise look bad. This smaller one will function just as good as the original sized one.

QUARTZ WATCHES WITH TRIMMER

In our quartz watches the quartz crystal is sort of our balance wheel and hairspring, as it holds a very steady rate of vibration (oscillation). However, the actual regulation is accomplished by a trimmer (or trim pot), if the watch has one. This is a capacitor which is made in a manner to allow us to adjust (regulate) our watch. This capacitor is really a variable capacitor. It has a screwdriver slot which we may use to regulate our quartz watch by using a screwdriver and turning it clockwise or counterclockwise while observing our results as shown on our timing machine.

REGULATING WATCH WITHOUT TRIMMER

If our watch does not have a trimmer to use as our regulator, then we can accomplish regulation by changing the oscillating crystal to one that will oscillate at a different rate. Since oscillating crystals come with different values, this method really works; that is, if we know what value it is and what value we need. We now need to follow the steps shown here:

1. Place watch on the timing machine and note the amount fast or slow. Let's say our watch is 37 seconds fast in 24 hours. Our timing machine may not be able to show this extreme amount; however, it will probably have a means to

indicate whether the watch is fast or slow. It may be just an LED dot showing on our timing machine denoting slow or, in this case, fast. This is expressed as over range; that is, the watch is either too slow or too fast to show on our timing machine. In this case we will first need to use the old-fashioned method by observing the watch, let's say over a 24-hour period. Now we have established the rate as being 37 seconds fast.

2. Remove the existing oscillating crystal by unsoldering the two lead wires.
3. Next we need to select an oscillating crystal that we know has a value of minus 37 seconds per 24 hours. When installed it should compensate exactly for the plus 37 seconds and the watch should run like a quartz watch should.
4. We need to stock several crystals (I suggest one or even two dozen). The real reason for a good selection is so we will be sure to get some crystals that are fast and some that are slow. The ones that are the very closest to "on time" we will use when we are just replacing a defective crystal, and the ones that are "way off" we can use for jobs like this one.

OSCILLATOR TESTER

Now we need a method to predetermine the rate of each crystal before we place it in the watch. An oscillator crystal tester can be purchased at a reasonable cost and we recommend this, or we can make our own from a quartz watch module. (1) Select a quartz module that runs quite close or regulate it if necessary. (This is the last time we will regulate this tester watch.) This watch now becomes our standard to which we will check the rate of our future quartz crystals. (2) Remove the existing crystal and solder a short wire to each of the two terminals. (3) Attach alligator clips to the ends of each wire.

To use an oscillator tester:

1. Place a new oscillator crystal onto alligator clips.
2. Place tester watch onto timer and read results. Test each of the new crystals (all two dozen) and place each one into a separate plastic bag and write the rate on the bag for future reference. We will end up with many different rates, maybe even 24 different ones. Hopefully, one will read a minus 37 seconds, as this is what we need to compensate for in our watch which is gaining 37 seconds.

So, we replace the oscillator crystals when: (A) We need a new one; (B) We just need a method to regulate those watches without trimmers; and (C) If the watch has a trimmer, but we cannot bring it into a time range with its trimmer. If the watch is worth repairing, we should be able to change an oscillator in a short time.

BULLETIN BOARD

A. NEW REQUESTS

GRAPHITE IN GOING BARREL
A Texas member writes: I have worked on several Chelsea clocks and was puzzled to find graphite in the going barrel. The first time I simply replaced it with mainspring grease. After finding it in a second clock, I am wondering if it was done by design. Could you give me some information on this?
EDITOR'S NOTE: We have heard of graphite (or similar material) being liberally used on certain modern German clocks. This is particularly true of cuckoo clocks. We have not heard of it used in the manner described by our Texas member. Please drop the "Bulletin Board" a note if you have observed the use of graphite or similar material used in this or any other manner. Of course we are familiar with the customer inflicted WD-40 applications; please don't write about them.

UNIDENTIFIED TRADE MARK
We have searched our files as has B. Jadow & Sons, Inc. for the identification of the trade mark (reproduced below) without success. We will appreciate any help we can get with its identification.

B. RESPONSES

We have had complete or partial responses to our requests for the following items; however, if you have additional information we would be pleased to add it to what we have already gathered.

AIRCRAFT CLOCK – WAKEMAN 7510
CYLINDER "BLANKS" OR "SHELLS"
QUICK-DRYING EPOXY TYPE GLUE
(See Section "D"–Readers' Commentary)
STOPPAGE OF HERSCHEDE GRANDFATHER CLOCK
(See Section "D"–Readers' Commentary)

C. ITEMS STILL NEEDED

CASES FOR MECHANICAL CHRONOGRAPH WATCHES
AWI often receives requests for a source for cases for the older mechanical chronograph watches. The most recent request was for a Landeron calibre 248 case.

We would like to develop a list of reliable sources for these specialty cases as well as a list for dress watch cases, for mechanical name brand watches.

SQUARE AND OVAL DOMES
An Ohio member is seeking a source for square and oval domes, the kind used to cover skeleton clocks. No preference is mentioned, but we assume both glass and plastic sources will be welcome.

AWI has received this request on a number of occasions in the past. We have only been able to name sources for the round domes–the type used for 400-day clocks.

FLORAL CLOCKS
A Wisconsin member has taken on the task of restoring (or replacing) a floral clock for his community. AWI has received requests from others in the past regarding floral clocks; they seek sources for:

* replacement parts
* complete clock units
* technical information
* service.

JUNGHANS A09
A member in Brooklyn, New York is seeking assembly instructions or diagrams showing how to assemble this calibre clock movement. *(EDITOR'S NOTE: This is one of many requests we receive for repair information about older Junghans chime clocks. We would welcome repair notes, bulletins, parts identification, etc. on this A09 calibre as well as any other calibres you might have.)*

K&D STAKING TOOL REPAIR
From Locust Valley, L.I., New York a reader needs to have a new bushing installed in his K&D staking tool. The K&D manufacturer has advised him that they no longer perform this service. Can anyone name a firm who does this repair?

ROLEX GMT MASTER CASE
A member from Illinois is looking for a source to find a revolving 24-hour bezel for a Rolex GMT master case #6542 (11.59). The watch is about 25 years young.

DO YOU HAVE INFORMATION REGARDING THIS MONTH'S REQUESTS?

If so, please write us at:
"Bulletin Board"
HOROLOGICAL TIMES
3700 Harrison Avenue
Cincinnati, OH 45211

Thank You!

D. READERS' COMMENTARY

QUICK-DRYING EPOXY TYPE GLUE
In the "Bulletin Board" in the January issue of *Horological Times* is a request for information on the applications of such products as Aron Alpha® and Loctite®. At the risk of being overly technical, I feel that these products should be distinguished from each other if their proper functions are to be understood.

The most important point is that these products and epoxy belong to three distinct categories of adhesives. Aron Alpha is a cyanacrylate, Loctite is an anaerobic adhesive, and epoxy is a two-part adhesive which is very different from the others. Additionally, within these categories, e.g. epoxy, there is a wide range of types suited to specific jobs. For

instance, within the epoxy group are products which resist wetting, products which should not be used in damp environments, products which set in five minutes, those which give up to two hours of manipulation time (incidentally developing a much stronger bond), and products which are formulated for high or low abrasion resistance.

These adhesives are extensively used in industry and their manufacturers have printed catalogs of their products and their applications. These catalogs are available from the manufacturers and from industrial supply houses listed in the Yellow Pages. I am enclosing several of these catalogs for each group. Note that while Loctite generically refers to a thread locker, a number of products are marketed under this name.

I am employed as a clockmaker, engineering technician, and instrument maker and have done a fairly thorough study of these products as well as other useful adhesives. Although I don't consider myself a talented writer, I would be willing to write some sort of article, short or long, on these chemicals and their applications if the editors of the *HT* so desire.

Ron Schorr
Lawrence, KS

EDITOR'S NOTE: We have encouraged Mr. Schorr to write an article on these products and look forward to being able to share it with HT readers in the near future.

STOPPAGE OF HERSCHEDE GRANDFATHER'S CLOCK (ONE MEMBER'S SOLUTION)

I saw a request for suggestions to cure a Herschede that stopped as it would go into chime. I had a similar problem after repairing one of these clocks. I polished the pivots, bushed it where needed, and test ran this clock for two weeks. I then delivered the clock to the owner. When I got back to my shop I heard from my customer that the clock had stopped 45 minutes after I left their home.

I went back to their home the next day sure I would find the problem, cure it, and be on my way. To make a long story short, I lugged the mechanical marvel back to my shop and set it up in the test stand. I thought of every possible thing that could keep this clock from functioning as designed. No luck. The beast would not do anything for more than a couple hours at best.

At this point I went to talk with another clockmaker I know. We talked for several hours and finally I swallowed my pride and mentioned the Herschede. We touched on every possibility–lift levers, escapement problems, etc. After speaking with this fellow, I went back to the clock and removed the pin barrel and started checking the escapement. This time when it stopped it appeared to act as if one tooth was too long. Upon examination I found the eccentric nut or moveable bushing which supports the front anchor pivot was out of adjustment. I have no idea as to how this bushing got out of adjustment. The clock had enough power until it went into the chime mode.

I hope this will help someone out who has a Herschede acting like this.

Douglas L. Goldstein
Eagle River, WI

INTRODUCING...

This Year's Candidates to AWI's Board of Directors

JAMES ADAMS
Shelbyville, IN

ROBERT J. BISHOP
Glenshaw, PA

JOSEPH L. CERULLO
Cranford, NJ

DAVID H. FRYDAY
Menlo Park, CA

RALPH E. GEIGER
Indianapolis, IN

GEORGE H. KISER
Austin, TX

DONALD R. LOKE
Wallingford, CT

JOHN S. MARTIN
Jefferson City, MO

Of the eight nominees pictured here, you, the AWI membership, will elect three individuals to serve a three-year term of office. They will join the other Board members during the annual Board of Directors meeting June 25-26 of this year. They will select AWI officers for the coming year from within their ranks.

In a few weeks, ballots, information about the candidates, and voting instructions will be sent to each active member who is eligible to vote. This material will come by first class mail. Ballots are to be marked and sent in the **official ballot return envelope** which will be provided to the certified public accountant who is responsible for counting the ballots. *All ballots must be postmarked on or before the deadline date mentioned in the voting instructions.*

Only ballots should be sent to the certified public accountant. *Please do not include any notes or requests with your ballots as these would not be received by AWI personnel until sometime after July 1.* The CPA keeps all materials received during the election in his custody until that time.

During the annual Board of Directors meeting this June, the AWI Directors will meet to select from among themselves the Executive Board for 1988-1989. These officers will be President, Vice-President, Secretary, and Treasurer. Therefore, when you vote for the Board of Directors, you are also indirectly electing AWI Officers.

When you receive the election material please study the qualifications of each candidate carefully. The future of the American Watchmakers Institute depends a great deal upon the people who serve on the Board of Directors, those who are AWI officers, and the members of AWI committees. We hope each member will take the time to vote during this year's election.

We Salute These New Members!

AITKEN, Melissa–Burbank, CA
Sponsor: Charles Andracik–N. Hollywood, CA
ANDERSON, Leroy L.–Richmond, VA
Sponsor: M.R. Pellmann–Richmond, VA
ARNOTT, Duane S.–Toronto, Ontario, CANADA
BAUGHN, Monroe A., Jr.–Texarkana, TX
BENCZE, Robert J.–Melbourne, FL
BENNETT, George R.–Colorado Springs, CO
Sponsor: C. Oyler–Colorado Springs, CO
BOBAK, Thomas E.–Lancaster, NY
BOHANON, Hugh T., Sr.–Houston, TX
BRAINARD, Steve–Rockford, MN
BROOME, Thomas H., II–Dundee, NY
BUDESHEIM, Jim–Edmonton, Alberta, CANADA
CABRERA, Jose Ramon–Queens Village, NY
CALHOUN, Curtis–Topeka, KS
CHA, Jae Y.–Colorado Springs, CO
CHO, Chei-Chul–Gullabukdo, KOREA
CLARK, Diane–Ft. Worth, TX
COLLIER, Daphne A.–St. Paul, MN
COMPTON, Sylvia–Paris, TX
D'AMBROSIO, Thomas–Stonybrook, NY
Sponsor: Joseph F. Broderick–Smithtown, NY
DODDS, Ronald R.–Macedonia, OH
DOLL, Robert H.–San Diego, CA
ECKERLE, Jack–Cincinnati, OH
EGGERING, Bob–St. Louis, MO
EMERLING, Paul H.–Nederland, CO
EVANS, George O.–Annandale, VA
Sponsor: Marvin E. Whitney–Alexandria, VA
FOSS, James S.–Lewisburg, PA
GARNETT, H.L.–Overland Park, KS
GOEMANN, Ron–Des Moines, IA
HALL, Eugene J.–Columbus, OH
HANSON, Chris–Solvang, CA
Sponsor: John C. Steutel–Goleta, CA
HELBERT, Garland–Huntsville, AL
HEMMERLEIN, John P.–Fayetteville, NY
HO, Pok Wai–Ft. Lauderdale, FL
KNEISLER, Roy R.–Goshen, IN
LAMAN, Robert–San Antonio, TX
LAYHER, Arnold–Sebewaing, MI
LENTZ, Mike–Gainesville, FL
LEVINE, Bernard–Cincinnati, OH
Sponsor: Charles Cleves–Bellevue, KY
LO, Young-Hoan–Gullanamdo, KOREA
LOVCHIK, Chris–Wichita, KS
MOORE, Walker J.–Troy, OH
OGILVIE, Brian Galen–Pond Creek, OK
OLIVARES, Francisco–Chicago, IL
ORAVETZ, Paul E.–Monaca, PA
PARKER, David D.–Richland, WA
PATEL, Vishnu D.–Hoboken, NJ
PATTI, Nick J.–Chicago, IL
PEACH, Donald–Huntingburg, IN
POCENGAL, Joseph–Alamogordo, NM
REYNOLDS, James D.–Chicago, IL
ROBERTSHAW, W.E.–Dunedin, NEW ZEALAND
SCOTT, Kevin–Philadelphia, PA
Sponsor: Sherwin Zablin–Philadelphia, PA
THATCHER, William B.–Phoenix, AZ
THOMPSON, Richard Lee–Temple City, CA
Sponsor: John O. Michaelson–Monrovia, CA
TRESANSKY, George–Kensington, MD
Sponsor: R.G. Lokey–Silver Spring, MD
TURNER, Carrol V.–Cedar, MI
VANDEN BRUL, Robert–Kansas City, MO
VIMMER, E.A.–Westchester, IL
WALLK, Sam L.–Orland Park, IL
WEISS, Edward B.–Philadelphia, PA
WILKINSON, Harold A.–Burbank, IL
WOLF, James H.–Sarasota, FL
WOOD, Benjamin J., Jr.–Baltimore, MD
Sponsor: Dennis J. Warner–Havre DeGrace, MD
YARIJIAN, Armen–Beverly Hills, CA

FORUM

The FORUM is a column devoted to the discussion and debate of horological piffle, practices, and problems. Comments can be controversial, but should always remain within the bounds of good taste. Responses should be sent to:
AWI FORUM, P.O. Box 11011, Cincinnati, OH 45211.

By

Albert Dodson
CMC

Ralph Geiger
CMW, CMC, CEWS, CMBHI

An Old Controversy

"Give me the perfect oil, and I will give you the perfect watch." This statement attributed to Breguet identifies a problem which may be the most persistent problem faced by horologists—lubrication. Oils have improved vastly since Breguet's time, but the problems associated with oils have been reduced by only a minor degree. From time to time the controversy of whether oil is necessary is brought up. The "oilers" and the "nonoilers" both have some compelling reasons to support their points of view.

The nonoilers point out that historically there are examples of timepieces which were purposely "put up dry" and performed well, and upon later disassembly and inspection showed no abnormal signs of wear. (One such example was a navigational chronometer used on a polar expedition.)

A very compelling argument for not oiling a timepiece is that oil can trap dirt which will act as an abrasive and thus promote a condition which it is supposed to prevent—namely, excessive wear. Might all those badly worn recoil pallets be in better condition if they had not been oiled? The people who advocate oiling point out that a lubricant is necessary to reduce friction and enable a more uniform flow of power to the oscillator and thus a more uniform rate.

Both sides are correct in their viewpoints. As horologists we are charged with both tasks of preserving the physical integrity of the timepiece (as well as attempting to discourage any subsequent deterioration) and assuring its best possible performance. Is it possible to achieve one of these goals without compromising the other? What can be considered as good repair practice in regard to the use of lubricants?

Clock Nomenclature

For many years the nomenclature pertaining to watches has been more or less standardized. There may be many reasons why this is so, but interchangeability of parts and subsequent cataloging surely had a significant influence in establishing the practice of using only one name to identify each component (a notable exception being the set lever which is still commonly known as a detent). It is only logical that things be given one name if confusion is to be kept to a minimum. Clocks, on the other hand, never developed an international standardized nomenclature.

Indeed, the nomenclature is rarely even standardized within a single city, let alone a country. Pallets are also known as verges, anchors, and possibly simply as the escapement. Verge is also the name of a specific type of escapement. (I once had a clockmaker describing a fusee watch to me and I asked if it was a verge, to which he replied with some confusion, "Yeah, it had a verge.") Then there are strike flirts, which are known as levers with a variety of different names. Cannon pinions and clutches; hour cams and snails; contrate wheels and crown wheels; ratchets and clicks; fans and flies; arbors and shafts; all are two different names for the same thing, and oftentimes names for other things as well. I am familiar with most of the different terms used to describe the various parts of timepieces, but am occasionally confused regarding the specific part in question if it has multiple names.

There is so much variation in nomenclature that to be able to read a single trade journal one must be fluent in all the dialects. Are clockmakers comfortable with this situation? Is there a need or desire to standardize clock nomenclature? Just where is the third wheel in an 8-day clock, anyway?

GOT AN OPINION?
GOT THE FACTS?

WRITE US
AND SHARE YOUR THOUGHTS!

No doubt you have seen this in a barrel—but have you ever seen where it occurred in a "C" retainer ring?

John S. Keller, clockmaker, Gloucester, VA brought this oddity to the Horological Association of Virginia's 1987 Fall Seminar, Richmond, VA.

(John, how long did it take you to get all those pieces in place?) Photo by Skee Jenssen. Submitted by M.E. Whitney.

Chime and Strike

Illustrations by Steven Conover.

Joseph L. Cerullo, CMW

A Self-Winding Ship's Clock

Not too many people have heard of this clock made by Bulova, much less seen it. As a 1976 graduate of the Joseph Bulova School and a former Bulova employee, I was surprised to find that some long-term Bulova people hadn't heard of it, either. So I'd like to share some information on this clock with you.

Figure 1 shows the clock bearing the Bulova name and unusual case design. It has a 2¼ inch dial, and the case is 5 inches high including the stem. The clock is mounted by the bracket around the dial. There are two types of mount: a flush mount for dashboard style, and a gimbal mount for overhead or bulkhead placement.

The clock is fitted with a basic 19 ligne, seven jewel, Swiss lever movement. It is marked "Bulova" and "Made in Switzerland." There is a serial number 50540 on the barrel bridge. The movement is fitted with two mainsprings, for eight day operation. It can be manually wound by the stem, a conventional pull-type for hand setting. Unlike other self-winding timepieces, this one does not have bridled type mainsprings. They are standard tongue ends. It appears that the basic movement is simply a 19 ligne, eight day movement of the kind used in desk clocks in the early 1930s.

It is the addition of the self-winding mechanism that makes this clock interesting. The mechanism is fitted to a base plate (9), which attaches directly over the back of the movement with three screws. Figure 3 shows the location of the screws (10), which are blued for easy identification.

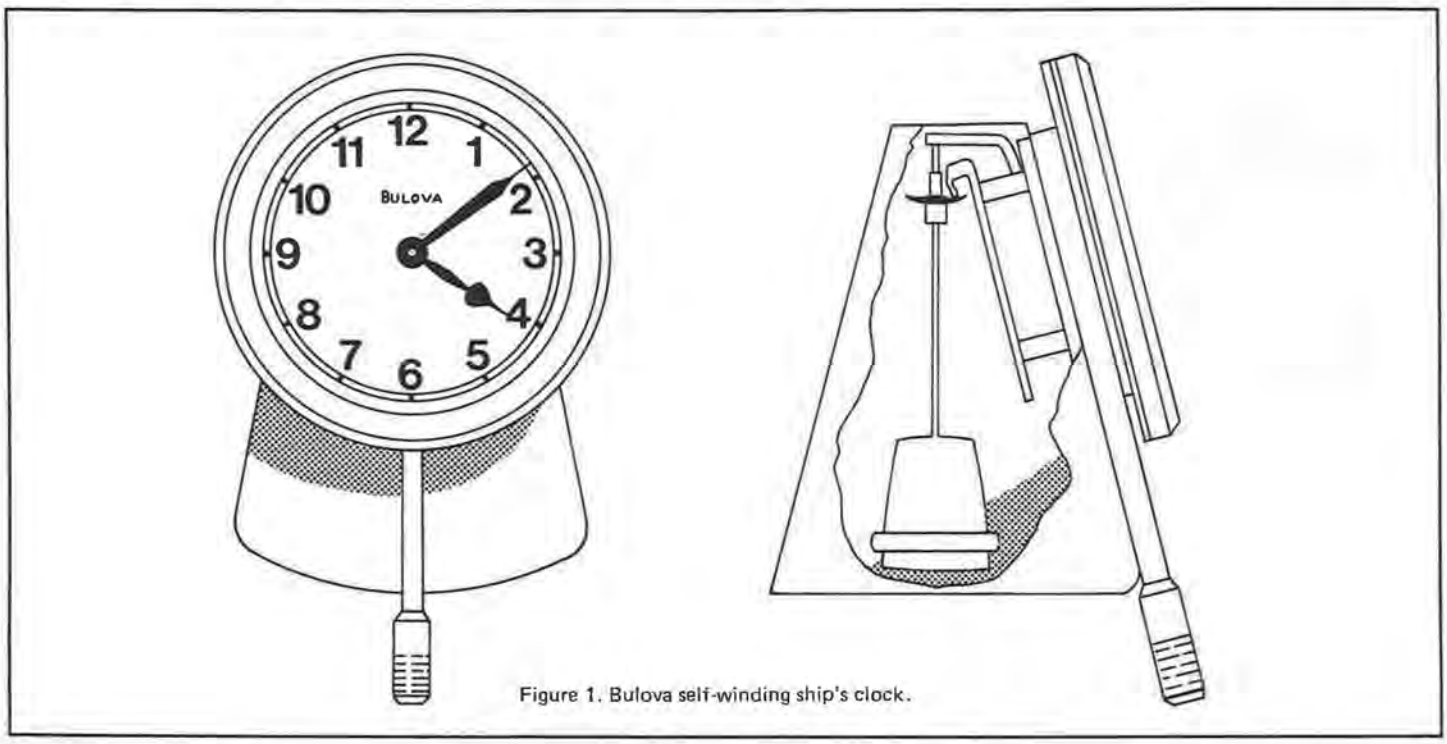


Figure 1. Bulova self-winding ship's clock.

Figure 2. Self-winding unit, rear view.

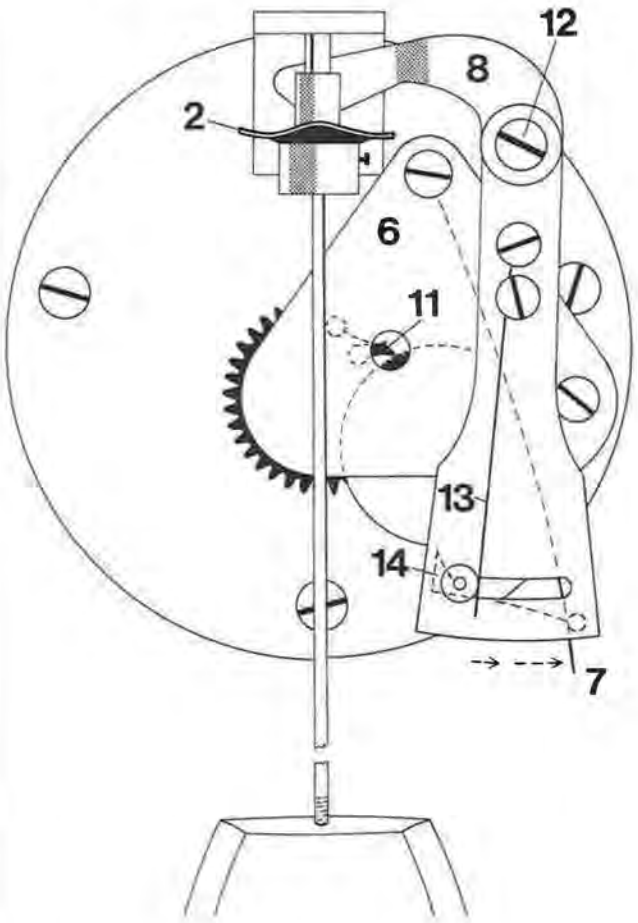
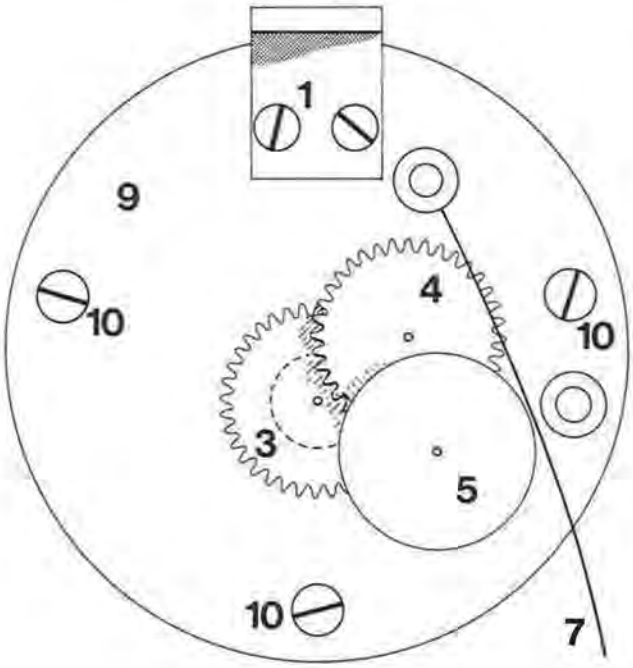


Figure 3. Layout of self-winding train.



Parts List

1	pendulum bracket	7	centering spring
2	upper & lower cam plates with ball joint	8	pawl lever
3	winding wheel	9	base plate
4	transmission wheel	10	mounting screws
5	ratchet wheel for self winding unit	11	click
6	transmission wheel bridge	12	mounting point for pawl lever
		13	tension spring
		14	pawl lever click

Self-winding Unit

Refer to Figures 1 through 4 for parts identification. The self-winding mechanism is operated by a pendulum suspended from a pendulum bracket (1). As the ship rolls in various directions, the swinging pendulum transfers motion to the upper and lower cam plates as an up-and-down motion. The pawl lever (8) converts this motion to a back-and-forth winding action. The rest of the self-winding operation is accomplished through the ratchet wheel (5), and the winding and transmission wheels (3 and 4).

How It Works

The theory is simple. Figure 2 shows the complete self-winding assembly. The lead-weighted pendulum constantly swings in response to any motion of the ship. The case itself limits the amount of swing, and a rubber bumper on the weight keeps things quiet.

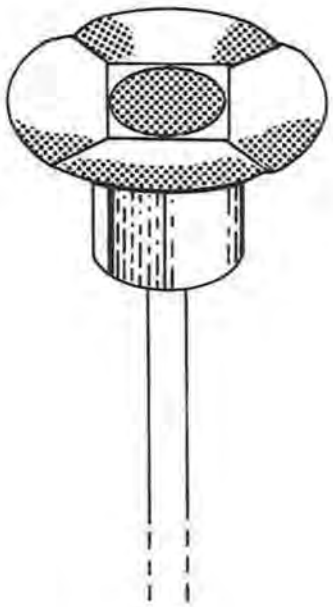
At the top of the pendulum rod, the mushroom-shaped lower cam plate, shown in Figure 4, is fixed on a ball joint. The matching upper cam plate is mounted on a slide tube, above the lower cam plate. As the weighted pendulum swings in any direction, the lower cam plate rocks. In response, the upper cam plate moves up and down the slide tube. The up-and-down motion of the upper cam plate provides the force needed to wind the clock.

The pawl lever (8) converts this motion into lateral movement. The lever is mounted over the transmission wheel bridge (6), where it transmits this side-to-side movement. The upper portion or heel of the pawl lever rides on the inside dished portion of the upper cam plate. As the cam plate rides up and down the slide tube, so does the heel of the pawl. This causes a lateral swing of the lower section of the pawl lever.

As shown in Figure 2, the spring click on the pawl lever pushes the ratchet wheel (5) in a clockwise direction during a move to the left side. The small click (11) on the underside of the transmission wheel bridge maintains the ratchet wheel position as the pawl lever returns to the right side. The centering spring (7) returns the pawl lever to the right side and back to the rest position. It is this spring which keeps the heel of the pawl pressed against the upper cam plate. This in turn maintains constant pressure between the two cam plates.

Figure 3 shows the layout of the self-winding train.

Figure 4. Detail of lower cam plate.



The pinion shown in dotted lines projects through the base plate. As it turns slowly clockwise, it engages both ratchet wheels of the movement (not shown), winding them counterclockwise.

Protect Against Overwinding

As I mentioned earlier, the mainsprings are not bridled, and therefore can become fully wound. What then would prevent the self-winding unit from overwinding the springs, causing breakage or damage to the unit itself? The pawl lever click (14) is mounted through a slot in the base of the pawl lever. A tension spring (13) holds the click in its position of engagement at the far left of the slot. It is possible for the mainsprings to become fully wound, or for a mechanical blockage to occur in the transmission wheels. If this happened, the ratchet wheel would not be able to advance in its clockwise direction. The sliding click and tension spring will absorb the energy from the swinging pendulum. The click remains locked on the ratchet wheel, but the entire pawl lever moves to the left because of the slot.

Some Conclusions

I used one of these clocks on my pleasure boat for some time and found it to work very well. The accuracy of the clock movement was the only disappointment!

As far as I can determine, the Bulova self-winding ship's clock was never sold to consumers for pleasure boating. The Bulova Watch Company has, in the past, been commissioned by the U.S. Government to make timepieces for the military. Most of this work was done in their New York plant, not in Switzerland. The self-winding clocks are dated October 24, 1937 on the original outside packaging, so it's possible they were made in limited quantities for the government or a boat or yacht manufacturer.

The particular clock featured in this article will now be donated to the AWI Museum in Cincinnati, where it will remain on display.

A HOROLOGICAL CROSSWORD PUZZLE

The definitions are taken from the *AWI Clock Q&A* book in case you need to look any up.

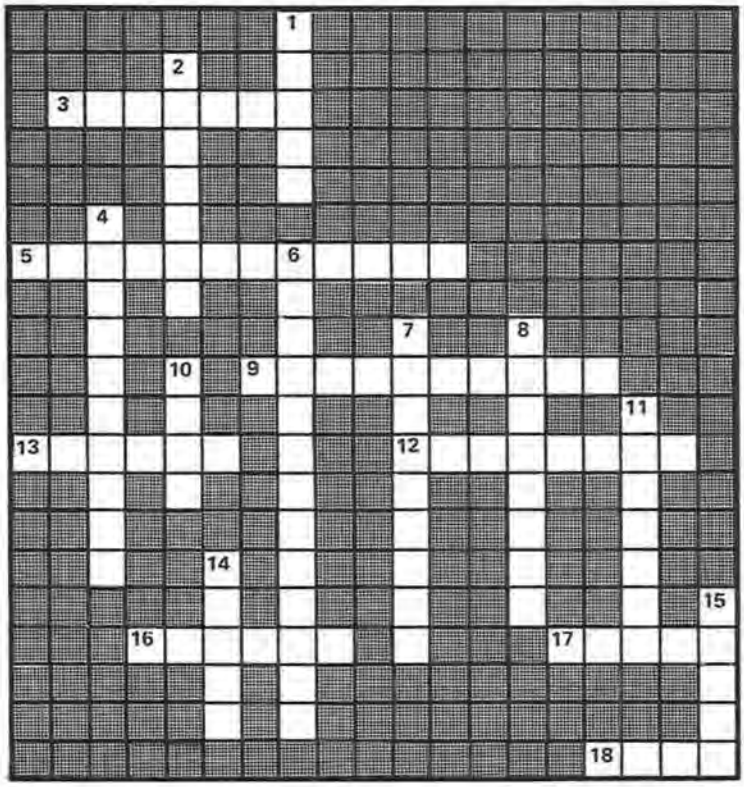
ACROSS

3. A form of cock or bracket attached to a plate supporting one pivot of an arbor.
5. A chime clock part which determines the drop of the rack and the quarters to be struck (two words).
9. The hand attached to the cannon pinion, revolving once every hour (two words).
12. The arm attached to the rack which drops onto the snail, determining the number of strikes.
13. The cap or end piece of a lantern pinion into which the pins or trundles are fitted.
16. The circular container in which a mainspring is coiled.
17. A conical-shaped brass spool with concave profile on which spiral grooves are cut. Designed to equalize the power output of the mainspring.
18. The face of a clock from which the time or other functions can be observed.

DOWN

1. The projections around the periphery of a wheel.
2. A source of motive power used in many clocks.
4. A long, thin strip of tempered steel, with resiliency. Vary in thickness and length.
6. A term synonomous with pin wheel and hammer wheel. All three carry the hammer tail lifting pins (two words).
7. A wheel fitted with triangular, pointed teeth. Frequently used to lift a lever (two words).
8. The lever which engages the rack teeth and prevents the rack from falling back onto the snail (two words).
10. In a weight-driven clock, the cylindrical barrel on the mainwheel arbor on which cord or cable is wound.
11. The riveted or screwed rods which act as spacers and hold the plates together.
14. The piece set at right angles with the axis of escape wheel, and which regulates motion of escape wheel.
15. The grooved ring which holds the crystal.

(Answers on page 48.)



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Expires December 31, 1988

TWO CHANGES IN OMEGA CALIBRES 1455 & 1458

Adapted for *Horological Times* from
Omega Technical Communication # 135

by J.L. Asbrock

Watchmakers will want to make note of changes on any technical bulletins they have for Omega calibres 1455 and 1458. Two changes provide for automatic adjustment of the time rate whenever there is a change of frequency or temperature within the watch. AWI will routinely include this information in all future bulletins it supplies for these calibres.

I. RATE ADJUSTMENT THROUGH "INHIBITION"

Instead of adjusting the time rate by adjusting the frequency of the quartz resonator, this new method provides for time variations to be compared to a standard frequency which is built into the integrated circuit at the time of manufacture. The time variations then are automatically adjusted by cancelling a certain number of impulses at the 16,384 Hz level of the division chain which occurs in the integrated circuit. This process is called "inhibition."

The adjustment is controlled by a program which is set up permanently in the integrated circuit. This program can handle an unlimited number of time variations, even when the current has been interrupted, such as would occur during the process of changing a battery. Particular care must be taken, however, **NOT TO INTRODUCE STATIC CURRENT INTO THE MODULE WHILE REPAIRS ARE BEING MADE.** This system of inhibition can incite a loss in time only; therefore, an additional oscillator with frequency more than 32,786 Hz is included.

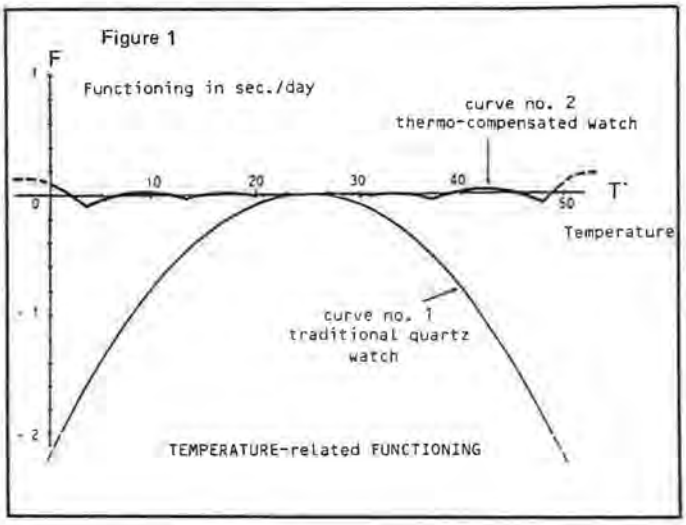
Omega watches having this automatic adjustment, triggered by frequency change, can no longer be checked for time by measuring the quartz frequency; they must be checked by measuring the motor impulses (using devices that respond to these motor impulses).

II. RATE ADJUSTMENT THROUGH THERMO-COMPENSATION

Rate adjustments through thermo-compensation insures an accuracy of + or — ten seconds per year.

A quartz crystal which vibrates at 32,768 Hz is greatly influenced by temperature (T) as the frequency (F) varies with square value, when compared to temperature (T) in a parabolic way.

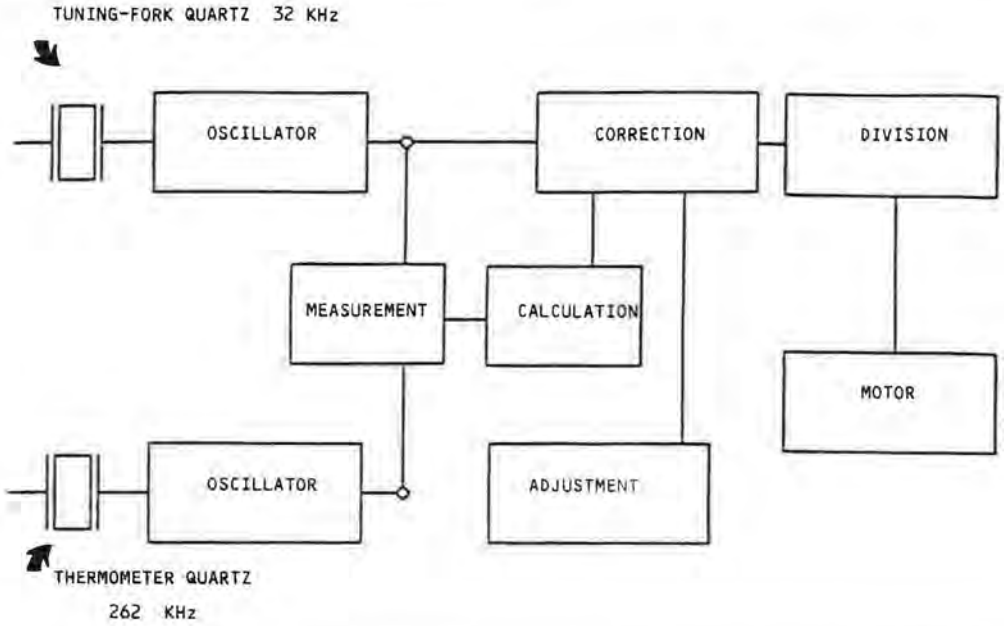
In Figure 1, the graph labeled curve #1 depicts the typical quartz watch (reproduced from the Omega Bulletin). +25 degrees Celsius has been chosen as the reference frequency (the top of the curve); therefore, a variation of + or —5 degrees Celsius must be accepted.



Every temperature variation over 5 degrees Celsius affects the frequency and considerably affects the precision of the watch. While a watch is being worn, it is subjected to very little temperature variation because the body temperature at the wrist serves to keep temperature between the 26-28 degree Celsius range. Considerable temperature variation can occur, however, when the watch is not being worn. For example: a watch placed into a lighted showcase will experience 30 degree Celsius temperature, or more. This will cause a considerable change in its rate.

The thermo-compensation feature, originally built into Omega calibres 1441 and 1445, consists of two oscillators, one having the conventional quartz frequency of 32 KHz, being in association with the other having a frequency of 262 KHz, and both being built on the same electronic module. See Figure 2 (taken from the Omega Bulletin). The oscillator, having the 262 KHz frequency, is very sensitive to temperature changes; it functions as a thermometer in this module.

Figure 2



The integrated circuit is equipped with a microcomputer which incites the quartz "thermometer" to oscillate every eight minutes. It operates at these intervals in order to conserve energy. During the period of oscillation the frequency of the two quartz units are compared. If a deviation is detected due to the temperature changes, the circuit calculates the correction factor.

This calculation is introduced into the permanent memories of the integrated circuit and causes the appropriate adjustment to be made through "inhibition." The parabolic curve #1, Figure 1, illustrating a conventional watch, is thereby changed into a straight line between +5 degrees Celsius and 45 degrees Celsius, as shown in curve #2 of the diagram. This illustrates the independence of frequency (F) compared to temperature (T).

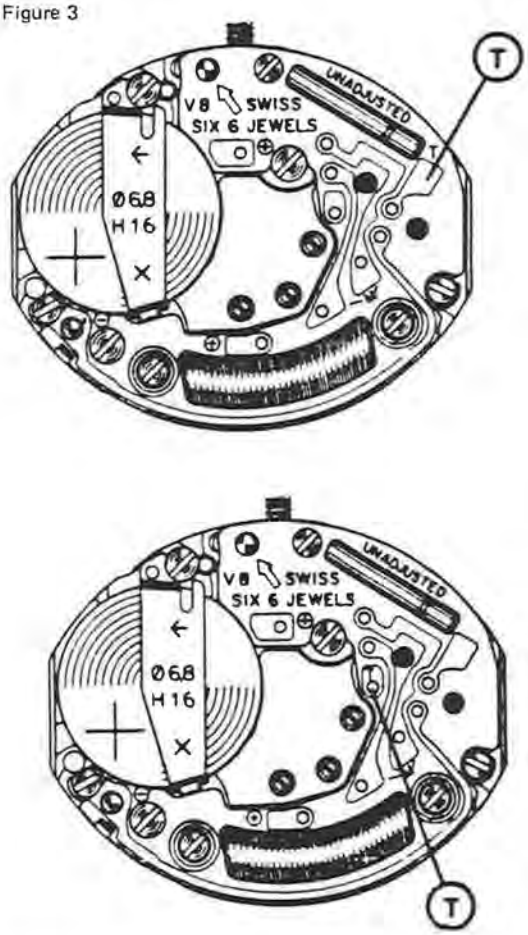
Calibres containing the two new innovations just described can also be adjusted by the watchmaker. The technical guide for calibres 1441 and 1445 explains the procedure.

The adjustment through "inhibition" is now being built into Omega calibre 1455 currently being produced; the watchmaker can recognize them as explained in Figure 3.

The most visible modification is the position of the test point "T." controlling the movement when functioning in accelerated speed at 32 Hz. This test point "T" has been repositioned as shown in Figure 3, also from the Omega Bulletin.

It is important to note that when test point "T" is located in this new position, it must be connected to the negative (–) pole, in order to obtain an accelerated advance (quick step). In movements without the "inhibition" the test point must be connected to the positive (+) pole.

Figure 3



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Novice Watchmaker

James Adams, CMW

Contacts

When I use the term *young watchmaker* I'm not referring to your age. I'm referring to your probable experience in our profession. When in an apprentice program or studying in a formal horological school you are taught the highlights of repair procedure. The fine tuning is left for you to master over the years.

In your formal education you no doubt learned the procedure to repair movements designed and manufactured 20 years prior to your schooling through what is currently on the market today. This ranges from the detached lever escapement movement through (maybe) balance wheel electrics and tuning forked movements and the current stepping motor quartz movements. Only the highlights of these procedures were hit since time is a limited commodity. All this is a normal state of affairs.

When I first sat at the bench in 1957 I was under the thumb of a watchmaker who, at that time, had 35 years in at the bench. He started his bench practices in 1922 and at that time was under another former watchmaker. So lucky me, I had my formal education *and* his oral history and bench practices to draw from. In many respects what I learned on the job was quite different and exacting than what I learned in the "hallowed halls." Each day I learned something of the old days. At that time, from 1957 to about 1960, we had an old-timer (some 80 years old) come in and pick up trade work to do. He would come in around 8:00 AM when I opened the store. I gave him jobs our boss wanted him to do and received back finished work. We usually had 20 to 30 minutes to talk. We hit it off real well! He was a pocket watch man. Wristwatches were fads to him and not worth wasting his time over. That's the truth! Between these two guys they filled in many blank spaces in my education.

As I mentioned in my last article, join a professional organization and make friends with the senior watchmakers. They have more knowledge than you can imagine, but you must listen. They generally speak so casually that unless you really listen you can miss many valuable tips. Sometimes the information will be in story form as they relate what happened in 1938 and so on. Even the archaic items they speak of are absolutely spellbinding.

Along with what we have been speaking of, it's necessary to build a technical library. Mine, for instance, comprises books on horological history. I also subscribe to the Swiss Ebauche technical guides from Switzerland and, when needed in a hurry, AWI reprints of technical guides of French and Japanese movements. These are ordered *only* as absolutely needed. Also available from AWI Central are binders for your *Horological Times*. These make for a nice, tidy way to store your *HTs*.

Below is a list of some of the books in my library.

Revolutions in Time, Landis
Watchmaking, Daniels
Watch and Clock Information Please, Sameluis
The Best of J.E. Coleman: Clockmaker, Hagans
Time and Timekeepers, Milham
Old Clocks and Watches and Their Makers, Britten
Questions and Answers of and for Clockmakers, AWI
Questions and Answers of and for Watchmakers, AWI
200 Years of American Clocks and Watches, Bailey
The Swiss Watch, Chapuis
Beauty of Clocks, Pearson
Horology, Haswell
The Ship's Chronometer, Whitney
Dictionary of Clocks, Exter
Cavalcade of Time, Fried
Earnshaw's Appeal, Reprint British Horological Institute
Principles of Timekeeping, Harrison, Arnold and Earnshaw Reprint British Horological Institute
Clock and Watch Trademarks, Kochmann
Technical Guide, Hattori Seiko
Quartz Watch, Zantech
Horolovar Guide
The Watch Escapement, Fried
Repairing Quartz Watches, Fried
The Black Forest Cuckoo Clock, Kochmann
The Modern Clock, Goodrich
Precision Time Measures, Higginbotham

Remember . . . to stand still is to fall terribly out of date in a very short time.

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Archie B. Perkins, CMW, FNAWCC, CMBHI

Antique Watch Restoration © 1988

Part XXVIII

FUSEE DESIGN

Occasionally a fusee is damaged so badly that it must be remade, or the main wheel containing the fusee is completely missing from the watch and the complete unit, including the fusee, must be made without a sample. In this case, many calculations need to be made in order to accomplish this task. If the old original fusee is available, then it can be copied when making the new one. If the fusee is missing, then a new one will need to be designed that will fit into the watch correctly and will match the mainspring that will be used to drive the fusee.

The purpose of the fusee is to equalize the force of the mainspring so that the power delivered to the train of the watch is constant throughout the running down of the mainspring from one winding to the next.

To design a new fusee to replace one that is missing, one must first determine how many steps the fusee must have to drive the watch the required number of hours. To know this, one would first count the leaves in the center pinion that the fusee main wheel drives. Let us say that the center pinion has 10 leaves. In this case, the fusee main wheel would probably have 70 teeth. One would not know for sure unless calculations were made. To do this, first measure the center distance accurately between the center of the fusee main wheel pivot hole and the center of the center wheel pivot hole. Let's suppose that the center distance is 10.20mm. Now, we have the following known information:

Center Distance = 10.20
Center Pinion has 10 leaves.
Assume that the main wheel has 70 teeth for calculating purposes.

We first need to determine the module (M) of the two gears.

$$M = \frac{\text{Center Distance} \times 2}{\text{Teeth} + \text{Leaves}}$$

$$M = \frac{10.20 \times 2}{70 + 10}$$

$$M = \frac{20.40}{80} = .255\text{mm}$$

Now, one must find the pitch diameter (P.D.) of the wheel.

Pitch Diameter = M x Number of teeth in wheel
= .255 x 70 = 17.85.

Now, find the outside diameter (O.D.) of the wheel.

Wheel O.D. = Pitch Diameter + (2.5 x M)
O.D. = 17.85 + 2.5 x .255
O.D. = 17.85mm + .6375mm = 18.49mm.

Now, calculate the center pinion to see if it matches the newly calculated main wheel. The following method is used to do this:

P.D. Center Pinion = Number of Leaves x M
P.D. = 10 x .255 = 2.55
O.D. of Pinion = P.D. + (1.25 x M)
O.D. = 2.55 + .32 = 2.87

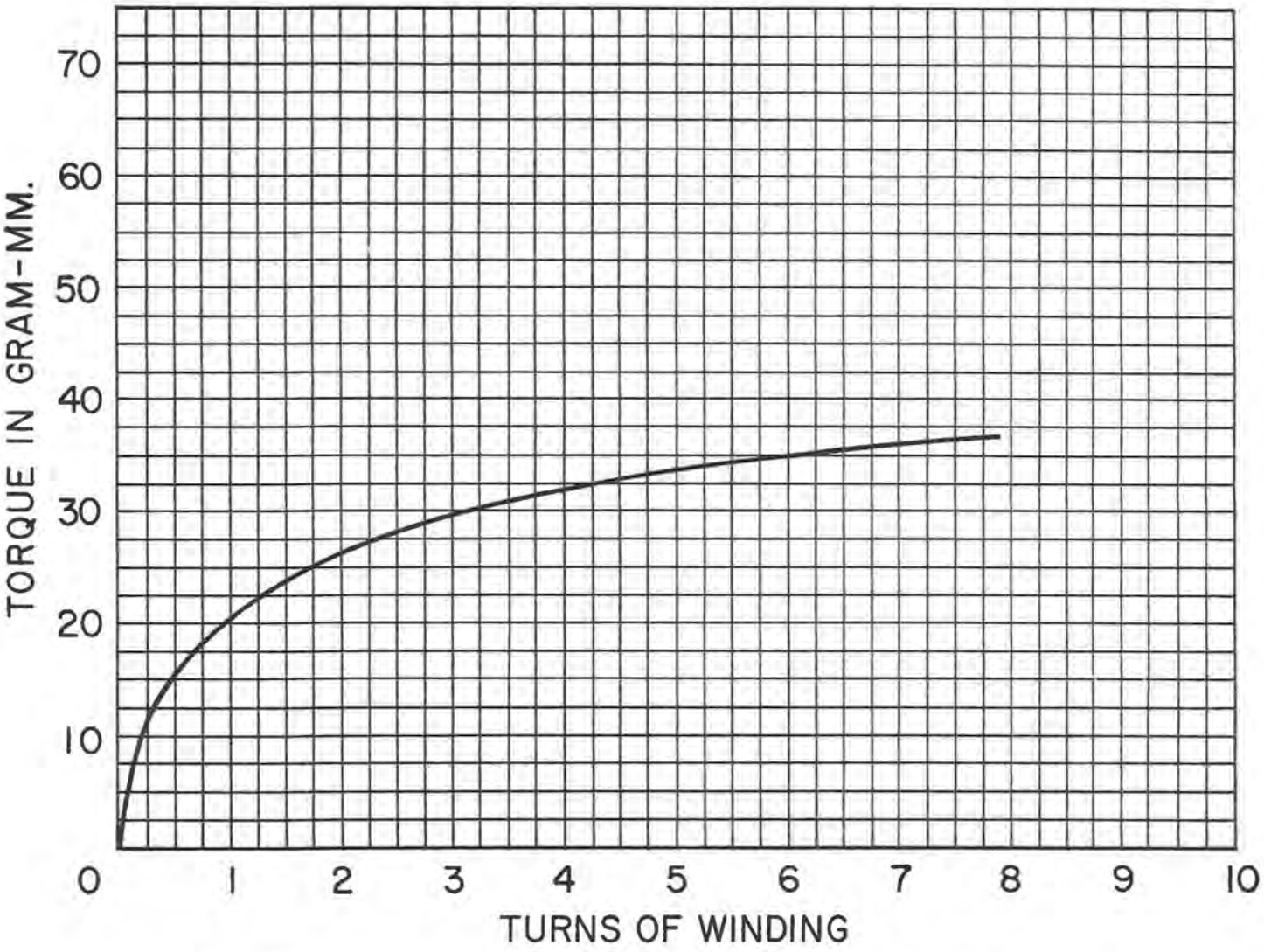
When the center pinion was measured, it was found to have an O.D. of 2.90mm which means that the 70 tooth wheel used in the calculation is the correct one for the watch. If the diameter of the center pinion in the watch had been much larger or much smaller in diameter, then the calculated main wheel would not be the correct diameter for the watch.

When doing the calculations with an 80 tooth main wheel instead of a 70 tooth wheel, the center pinion came out needing to have an O.D. of 2.54mm which is too small. When a 60 tooth main wheel was used in the calculation, a center pinion with a 3.25mm O.D. was called for which is larger than the one in the watch.

Now that we know the diameter of the missing main wheel, we can proceed to design the fusee. The diameter of the base of the fusee should be as large as possible while allowing clearance for the chain at the center pinion. The diameter of the fusee base should be slightly smaller than the diameter of the main wheel where the bottoms of the teeth reach (or the root diameter of the wheel). If the watch needs a maintaining ratchet wheel, then the diameter of the base of the fusee should be slightly smaller than the base diameter of the maintaining ratchet wheel teeth.

Let's suppose the base diameter of the new fusee will allow for the first step on the fusee to have a radius of 8.00mm. With this measurement known, we can proceed to calculate the radii of the other steps on the fusee, but first other information is needed. One question that needs answering is how many steps does the fusee need to run the watch the required number of hours? To determine this, one must determine the ratio between the main wheel and the center pinion.

Figure 1



$$\text{Ratio} = \frac{\text{Main wheel}}{\text{Center Pinion}}$$

$$\text{Ratio} = \frac{70}{10} = 7 \text{ or } 7{:}1$$

If it is desired for the watch to run 35 hours on one complete winding, then the fusee would need 5 turns because 5 turns x 7 (ratio) = 35 hours. This would mean that the fusee must have 5 steps. To calculate the radii of the 5 steps, the following information is needed.

Since the radii of the fusee steps are related to the power of the mainspring at each turn of the mainspring, then one must determine this by some method. Figure 1 shows a graph of the power curve of a first quality mainspring. This graph shows the power of the mainspring for each turn and quarter turn of winding of the mainspring. This particular mainspring was of such a length that allowed it to be wound almost 8 turns. When fully wound, it delivered a power of 365 gram-mm. It will be noted that as the spring unwound during the running of the watch, the curve drops off, which indicates that the mainspring is delivering less and less force to the train of the watch. It will also be noted that the power of the mainspring drops off drastically on the last turn just before being completely run down. It is this uneven force of the mainspring that is compensated for by the use of the fusee.

The power curve on this graph was gotten by the use of a dynamometer. The dynamometer is a laboratory instrument used to test the torque of mainsprings and hairsprings. Since the dynamometer is a laboratory instrument and not available to the watchmaker, then the watchmaker must use some other method of determining the power of the mainspring for each turn of winding.

Figure 2 shows a method that can be used to measure the power of a mainspring. The mainspring barrel with its mainspring is chucked in a wheel chuck in the spindle of the lathe. A torque bar is fastened to the barrel arbor as shown in Figure 2 for checking the force of the mainspring. This torque bar can be made up by the watchmaker with very little effort. One end of the bar has a small container suspended from the bar by string. The bar has a groove turned for the string to fit into to prevent it from moving on the bar during its use. The other end of the bar has two adjustable weights to be used for balancing out the bar. The large weight is for major effect and the smaller weight acts as a Vernier weight for the smaller effect.

To use the torque bar, the headstock of the lathe is turned by hand until a small amount of mainspring power is felt, then the headstock indexing pin is inserted into an index hole. Next, with the can in position on the bar, the weights are adjusted to balance out the bar. Now, the lathe headstock is turned so the mainspring is wound one turn. Note: The

index pin can be used to lock the headstock each time a turn is made on the headstock. Add weight in the can to balance out the bar. Remove the weight and place in a labeled envelope. Now wind the mainspring another turn and add weight to the can to balance out the bar. Label this weight as 2 turns. Repeat this procedure for every turn of the mainspring. After completing this process, check the weight of each group of weights and record this information. This information will be used to calculate the radii of the steps on the fusee.

Suppose that the weights were as follows:

1 turn = 1.4 oz. or 39.69 grams
2 turns = 1.6 oz. or 45.36 grams
3 turns = 1.8 oz. or 51.03 grams
4 turns = 2 oz. or 56.70 grams
5 turns = 2.2 oz. or 62.37 grams

Now we can calculate the radius of each step of the fusee. The radii of the steps are in inverse proportion to the weights for each one. That is to say that as the weights increase, the radii of the steps decrease. The calculation for each step is based on the radius of the first step of the base of the fusee.

We have decided previously that this watch required the radius of the first step to be 8.00mm. Therefore, the 8.00mm figure is used in calculating the radius of the first step as well as all of the other steps.

$$r1 = \frac{39.69 \text{ grams} \times 8.00\text{mm}}{39.69 \text{ grams}} = 8.00\text{mm}$$

$$r2 = \frac{39.69 \times 8.00}{45.36} = 7.00\text{mm}$$

$$r3 = \frac{39.69 \times 8.00}{51.03} = 6.22\text{mm}$$

$$r4 = \frac{39.69 \times 8.00}{56.70} = 5.60\text{mm}$$

$$r5 = \frac{39.69 \times 8.00}{62.37} = 5.09\text{mm}$$

Note: (1 ounce = 28.35 grams) (r = radius).

If these radii are charted on graph paper, there will be a power curve for the mainspring being tested. To have a more precise curve, the power of the mainspring should be checked each ¼ turn of unwinding or continuously as the dynamometer does.

This power curve can be scribed on a piece of metal plate to serve as a template to be used when cutting the steps on the fusee blank.

Figure 3 shows how the power curve just arrived at is applied to determine the new fusee shape. The steepness of the power curve varies with the height of the fusee, and the height of the fusee is determined by the available space between the plates of the watch for the fusee cone. The influence the height of the fusee cone has on the steepness of the curve is shown in Figures 3 and 4. The fusee shown in Figure 4 is one-half as tall as the one shown in Figure 3. Note the change in the shape of the power curve between the two illustrations.

Although the fusee makes 5 revolutions on one complete winding, the barrel only makes 3.78 turns in this particular watch. This is because the barrel is larger in diameter than the steps on the fusee. The following formula is used to determine the length of fusee chain necessary to fill the fusee that we are designing.

$$L = \text{SUM OF THE RADII} \times 2 \times \pi$$

One-half of the width of the fusee chain must be added to each radius before using the formula. Let's say the chain has a width of .52mm. Then we would add .26mm to each radius on the fusee and add all radii together. This would make a total of 33.12mm. Then we would have:

Figure 2

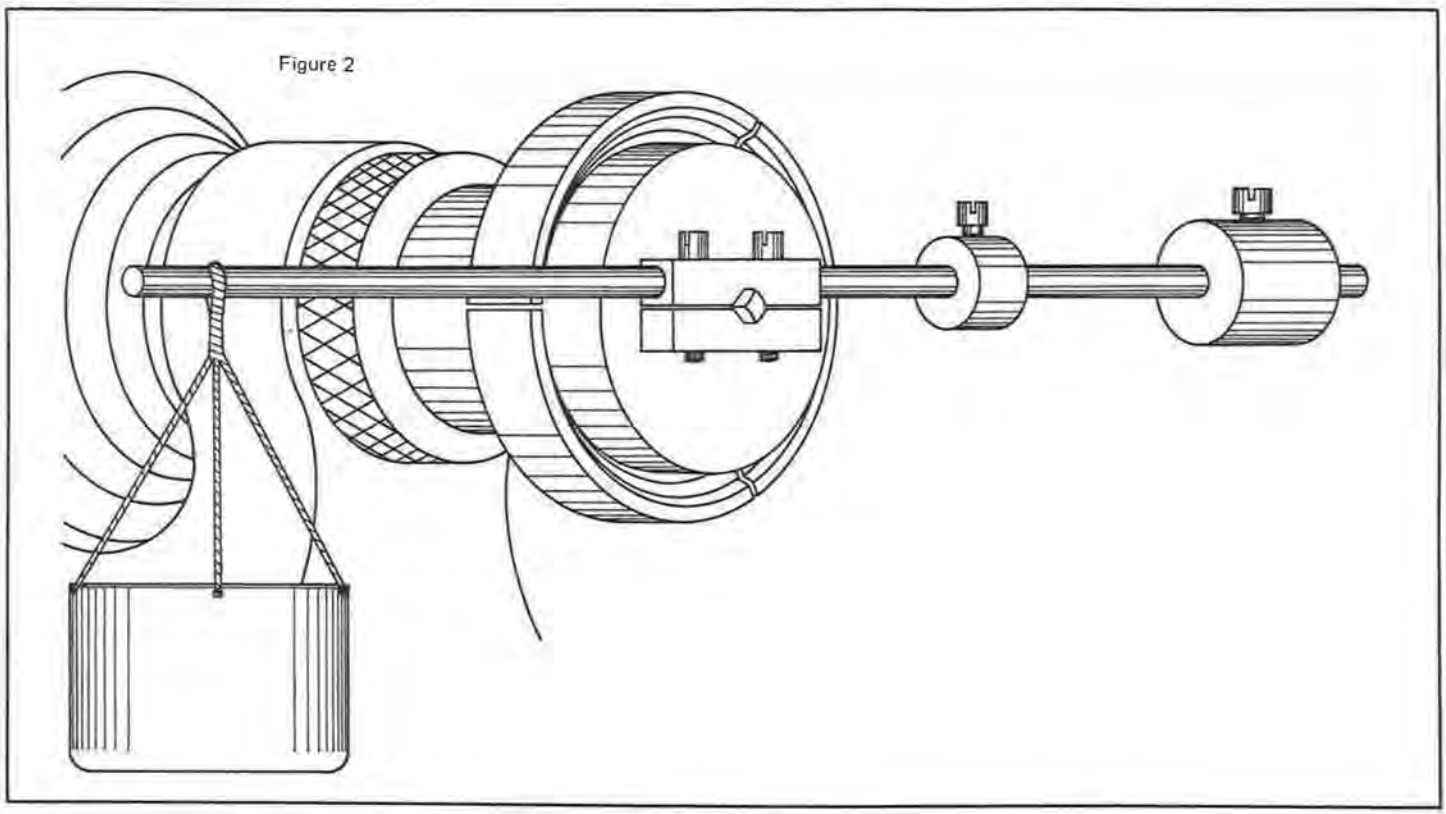


Figure 3

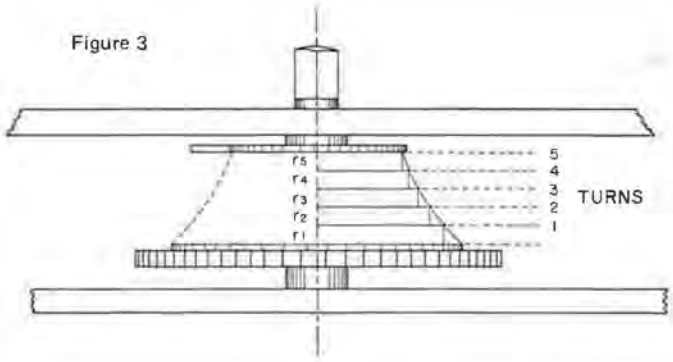
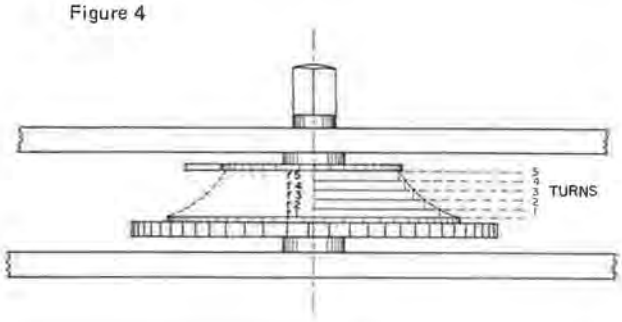


Figure 4



$$L = 33.12 \times 2 \times \pi$$
$$L = 33.12 \times 6.2832 = 208.10\text{mm}$$

Note: to obtain the total length of the chain, an amount would need to be added to this measurement to reach from the fusee to the barrel.

Now we calculate the circumference of the barrel. To do this, we first add the width of the fusee chain to the diameter of the barrel for the total diameter.

Circumference (C) = Diameter + Width of Chain x π

Let us say the diameter of the barrel is 17.00mm. By adding the width of the chain .52mm, then we would have

$$C = 17.52 \times 3.1416 = 55.04$$

Now by dividing the length of chain necessary to fill the fusee by the barrel circumference we would obtain how many turns it would take the barrel to turn the fusee 5 turns. We would have:

$$\text{Revolutions of Barrel} = \frac{208.10}{55.04} = 3.78$$

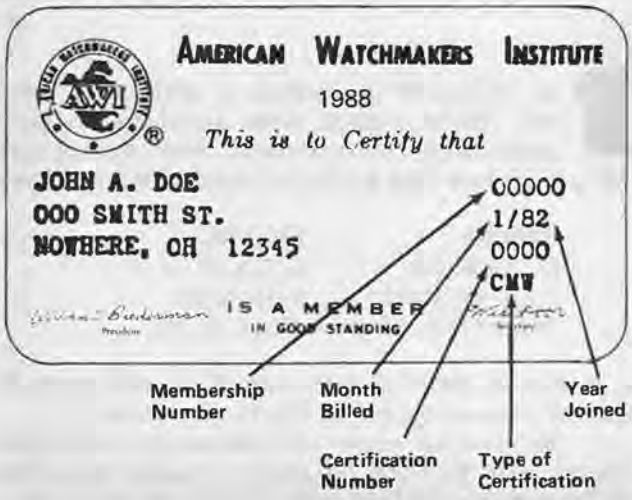
If the mainspring is of such a length to cause the barrel to make 5 turns, then there would be an excess of approximately one and one-fourth turns left over the amount needed to drive the watch 35 hours or 5 turns of the fusee.

"How to Make a Fusee" will be discussed next month.

TLHS

Your AWI membership card signifies that you are entitled to the many services offered by your association. However, we must have the correct information from your card to be able to serve you most efficiently.

This illustration points out the important, coded information on the right side of your membership card. Always use your AWI membership number when corresponding or ordering from AWI.



CLOCKS Inside & Out!

By A. G. Simon

UNDERSTANDING THE PENDULUM CLOCK

Part 3

Adapted from the AWI correspondence course in clock repair.

The selection of the numbers of teeth of the wheels and pinions requires some knowledge of higher mathematics. From experience, the numbers of leaves of the pinions have been pretty well standardized, as follows:

PINIONS	LEAVES
Escape Wheels	6, 7, 8, 10, or 12
3rd & 4th Wheels	8, 16, or 12
2nd or Center Wheels	10, 12, or 14

The number of teeth of the wheels will depend upon the number of leaves on the pinions that have been selected.

We know the number of vibrations required, which is 7,200 per hour. We know the number of escape wheel teeth and vibrations produced per tooth. We can select the numbers of the pinions. We can place these figures into an equation and designate the unknown numbers of teeth of the second, third, and fourth wheels by B, C, and D, respectively, as follows:

$$B \times \frac{C}{10} \times \frac{D}{10} \times \frac{30}{10} \times 2 = 7{,}200$$

Resolving this equation, we will find that BCD = 120,000.

Any numbers of teeth for B, C, and D can be selected provided their product is 120,000. In practice, the wheels are selected to diminish in diameter in progression so that the next wheel in line will clear the arbor of the one preceding it, and to keep the clock plates within selected limits. Usually each wheel is selected so that the number of its teeth will be equally divisible by the number of leaves in the pinion with which it gears.

MATH:

By combining (A x B x C) and making it = 120,000 we can compute the numerical values in the equation; thus

$$(A, B, C) = \frac{120{,}000 \times 30 \times 2}{10 \times 10 \times 10} = \frac{7{,}200{,}000}{1{,}000}$$

We must reduce the improper fraction $\frac{7{,}200{,}000}{1{,}000}$ by dividing 7,200,000 by 1,000:

$$1{,}000 \overline{)7{,}200{,}000}$$
$$7{,}200$$

To determine the numbers of teeth of the wheels B, C, and D, we must factor 120,000 into its prime factors. These prime factors are:

$$2^6 \times 5^4 \times 3$$

From these prime numbers we can form combinations from which we can select the numbers of teeth desired:

COMBINATION # 1

B = 2^3 x 3 x 5 (8 x 3 x 5) = 120

C = 2 x 5^2 (2 x 25) = 50

D = 2^2 x 5 (4 x 5) = 20

If B = 120 teeth, C = 50 teeth, and D = 20 teeth, then 120 x 50 x 20 = 120,000 and this satisfies our needs.

COMBINATION # 2

$B = 2^2 \times 3 \times 5 \quad (4 \times 3 \times 5) = 60$

$C = 2 \times 5^2 \quad (2 \times 25) = 50$

$D = 2^3 \times 5 \quad (8 \times 5) = 40$

If B = 60 teeth, C = 50 teeth, and D = 40 teeth, then 60 x 50 x 40 = 120,000 and this satisfies our needs.

By using other numbers of pinions, the selections could be carried out to infinity.

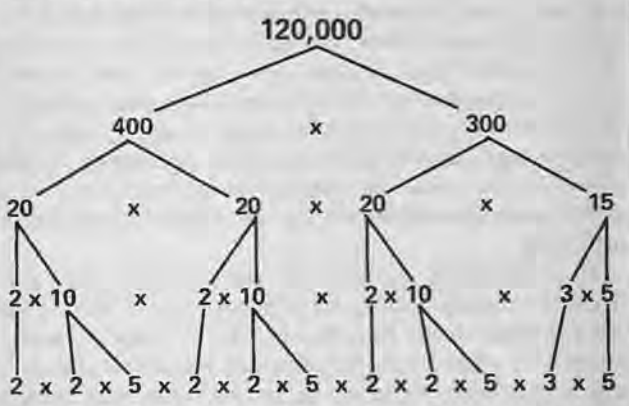
MATH:

A prime factor is a number which can only be obtained by multiplying itself x 1. Examples:

"2"—you can only obtain 2 by multiplying 2 x 1.
"3"—you can only obtain 3 by multiplying 3 x 1.
"5"—you can only obtain 5 by multiplying 5 x 1.

There are many, many others.

We will find the prime factors of 120,000 by making a factor tree, then we will gather the like prime factors and express them using exponents.



Gathering like terms: $2^6 \times 5^4 \times 3 = 120{,}000$.

We choose to use the wheels selected in Combination # 2 above, namely:

B = 60 teeth
C = 50 teeth
D = 40 teeth

Then our equation is as follows:

$$\frac{60 \times 50 \times 40 \times 30 \times 2}{10 \times 10 \times 10} = 7{,}200$$

We have now successfully determined the number of teeth of the wheels and pinions for the train of our one-day clock.

MATH:

Teeth on wheels . . $\frac{60 \times 50 \times 40 \times 30 \times 2}{\text{Leaves on pinions . . . . } 10 \times 10 \times 10} = \frac{7{,}200{,}000}{1{,}000}$

We must reduce the improper fraction of $\frac{7{,}200{,}000}{1{,}000}$ by dividing 7,200,000 by 1,000

$$1{,}000 \overline{)\,7{,}200{,}000}\quad 7{,}200$$

Having determined the numbers of the teeth and pinions of all of the wheels in the train except the main wheel and center pinion, we will now turn our attention to these. We have already determined that the pendulum will vibrate at the rate of 7,200 beats per hour; therefore, we can now find the numbers of the teeth of the main wheel and the center pinion and the number of coils required of the mainspring which will ultimately determine its length.

A one-day clock should run for 32 hours on one winding. This means that there should be 32 turns of the center arbor in that period of time. We may select a pinion of 10, 12, or 14 leaves. Let's choose one with 10 pinions. We can place this figure together with the number of hours the clock is to run (32), and the unknown number of teeth of the main wheel, which we will call "M" into the following equation:

$$\frac{M}{10} = 32$$

M = 320, which is the number of teeth required on the main wheel.

We cannot use a wheel with this number of teeth as it would be too large or out of proportion to the rest of the wheels, so we will reduce the number of teeth and have the wheel make more turns which will produce the same results.

A wheel of sufficient number of teeth which will give a ratio of wheel to pinion teeth of 5 to 1 (or more) is usually selected for a spring clock. If we select a ratio of 5 to 1, we will have a main wheel of 50 teeth, and dividing this number into 320 we find that the wheel will have to make 6-2/5 turns in 32 hours.

The mainspring selected must be of such strength that the difference between the number of coils in the spring when fully wound and the number of coils in the spring when run down will be at least 6-2/5 coils.

MATH:

To solve the equation $\frac{M}{10} = 32$ for M we must cross multiply.

$$\frac{M}{10} = \frac{32}{1} \qquad 10 \times 32 = 1 \times M$$

$$320 = M$$

This completes our discussion on the selection of gears and pinions for a typical one-day pendulum clock. The AWI Library has a number of reference books it can loan to readers who may wish to study this subject of clock trains more thoroughly.

THE PICKLE BARREL

Marshall F. Richmond, CMW

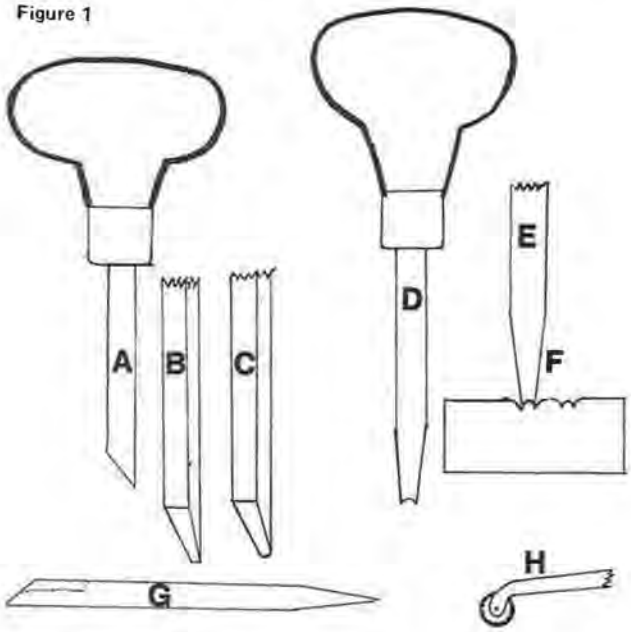
BASIC JEWELRY REPAIR

BEADING TOOLS, GRAVERS, AND DRAWPLATES

In doing jewelry crafting and repair much can be done with a limited amount of basic tools. Too limited an amount of basic tools, however, can limit the work to be performed. Many tools that we could do without can restrict some types of jobs we do or cause us to use too much precious time in doing them by improvising with the tools we have. It is important to use common sense and good judgement in purchasing tools and equipment. It wouldn't be practical to buy a costly tool for only a single job—especially if it is a type of job you would not have to repeat over a few times in your career.

A good example would be beading tools and gravers which are necessary in doing jewelry repair where replacing prongs and tips are among the jobs you'd perform (Figure 1). A millgrain tool (Figure 1H) is also a necessity, even for doing ring sizing where millgrain edges have to be matched. Drawplates and tongs are fine tools to have if you are to reduce the diameter of gold and silver wire. As all sizes of this wire are available from your supplier you may choose to purchase and stock many different sizes and colors. However, if you are using very much gold and silver wire it is probably more practical to stock one or two larger sizes in white and yellow and use the drawplate and tongs for reducing the diameter. These tools would pay for themselves in a very short time.

Figure 1



Beading tools (Figure 1A, B, and C) are an absolute necessity in doing jewelry repair, even though you don't set diamonds using bead settings. Quite often diamond rings in bead settings will come in with a loose stone and the only way to tighten it is with a beading tool. Although beading tools are not too expensive coming in sets of 12 sizes and a handle, it is wise to have a beading block (Figure 1C) to keep the concave ends burnished in good condition. In this way they will be able to maintain a good round dome shape on the beads you have to form or tighten.

Beading tools can be made from round water hardening tool steel using the flex shaft tool to taper the end. Better yet, a small lathe can be used to turn the taper as well as make the end concave. It can then have the concave (dome) end burnished and final shaped in the beading block (see Figure 2C). Point a in Figure 2C shows the concave end of the beading tool and the dome bead in the beading block. The finishing is done by choosing the size bead in the beading block and exerting great hand pressure on the beading tool and twisting. The beading block is much harder than the steel in the beading tool, so this burnishing pressure will shape the tool, and it will make a nice bead in stone settings.

Tempering is the next step, and the beading tool can be hardened by heating a cherry red and quenching in ambient water which will render it flint hard. It must then be drawn to the proper hardness for a beading tool. As the beading tool will be used on soft metals to form beads, it need not be too hard. A hardness when drawn to a color blue will be soft enough that the ends can be shaped in the beading block. Even though you do not make your own beading tools, the beading block is necessary for keeping the manufactured beading tools in the proper shape; the edges often get out of shape from making contact with the harder stone being beaded. Often in setting one stone, I use the beading block after forming each bead to keep my beading tool in shape for the next bead. The handles used for beading tools are made with a metal bushing so the tools are quickly interchanged yet held securely so they will not turn in the handle while forming beads or shaping in the beading block. Manufactured beading tools seem to be tempered to about the correct hardness so they can be shaped in the beading block.

GRAVERS

Gravers are made to cut metal for useful and ornamental purposes. The gravers we use for stone setting and trimming are the same gravers used for hand letter and ornamental engraving. Hand engraving is a trade by itself. Many jewelers have learned to do hand engraving which has helped them when doing jewelry repairing and setting stones.

There are several types of hand gravers. In doing jewelry crafting or repair there are two types most commonly used. These are the flat bottom (Figure 1B) and round bottom (Figure 1C). They come in several widths identified by numbers: flat gravers are 36 (narrowest) to 45 (widest). For round bottom gravers, number 50 is the narrowest and 59 the widest. Line gravers are flat bottom gravers that cut multiple lines with each cut. They are identified by two numbers—for example, 6 x 20. The 6 refers to the width between each line and the 20 refers to how many lines will be produced by each cut of the graver. The 6 x 20 would be half as wide as a 12 x 20 graver. The first number referring to fineness of lines is available in numbers 6 through 20 even numbers only, while the number of lines is available 2 through 12, all numbers odd and even.

Graver handles are available in several lengths, so for a new graver the shortest length can be used. As the length of the graver diminishes while the graver is sharpened, longer handles can be used so the graver fits the hand for best control. Gravers are exceptionally hard, the equivalent to a dark straw color if the temper is drawn using the color system. These gravers will even cut soft steel; they are the type used for hand engraving guns. In spite of the hardness, the ends do chip off while cutting softer metals, and they have to be sharpened. This can be done with an India oilstone combination, coarse on one side and fine on the other, and for a final finish using a hard Arkansas stone.

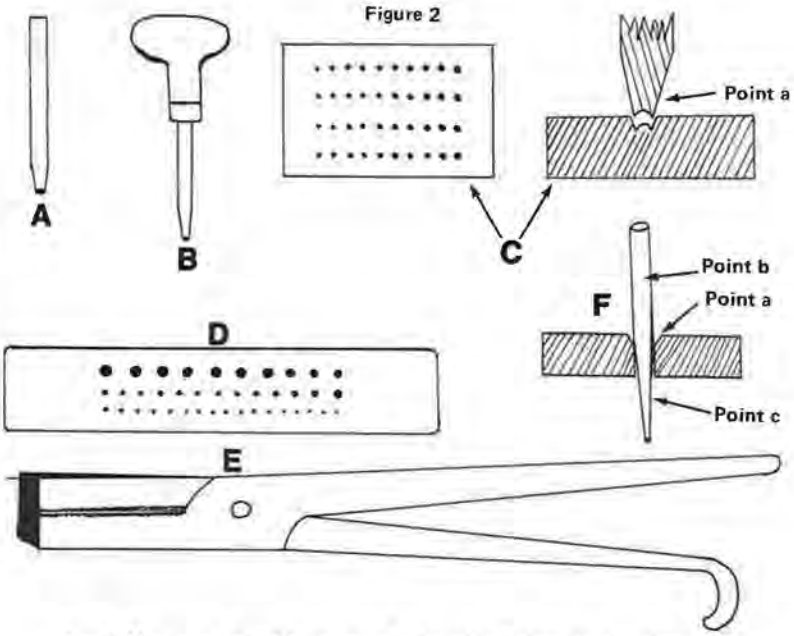
Holding devices called graver sharpeners can be purchased from your material supplier, or with practice they can be sharpened holding the graver in the hand and rubbing it on the stones. The wrist must be held stiff so the graver will not turn while rubbing; the end being sharpened may get rounded or out of proper shape. I have found a quicker and easier way to sharpen gravers using a wet slow speed grinding wheel made to grind glass. With this I can hold the graver against the side of the wheel at the angle needed and the rotating wheel does the cutting. The water keeps the graver from getting hot which could draw the hardness from the metal.

After sharpening flat and round bottom gravers on the stone, a bur will probably be left on the end which can be removed by jabbing the end in a piece of hardwood (the filing block is good for this). After the bur is removed the bottom should be polished which is done by rubbing on a piece of 4/0 buff paper cemented on a piece of plate glass about 6" square. This will put a mirror finish on the bottom of the graver and when a cut is made it leaves a mirror-bright finish in the bottom of the cut. Line gravers when sharpened do not have the bottom polished; only sharpen and jab into the hardwood to remove the bur. A good way to tell if a graver is sharp is to very gently push it into a thumbnail. If it is not sharp it will slip. The graver sizes that I have found to be the most used are the 36, 39, and 42 flat gravers and the 50, 52, and 54 round bottom. The line graver I use most is the 8 x 12, although I have several others. This is the one that I use to cut florentine finishes.

THE MILLGRAIN TOOL

Another small hand tool using a wooden handle that is necessary for doing jewelry repair or crafting is the millgrain tool (Figure 1H). This is a small wheel with a series of domed depressions around the circumference mounted in a fork made in steel rod. Its shank can be mounted in a wooden graver handle or used in a chuck handle so the different size tools can be used with the same handle. These can be purchased in sets of six with the chuck handle shaped similar to a graver handle. These tools, when rolled over an edge, leave a row of uniform beads making a very attractive edging. One style wedding band is called a "millgrain edge band" because both sides of the band have millgrain all around each edge. Millgrain edge is used on flat diamond settings after the stone is set and the bright cuts around the stone have been completed. Many diamond engagement rings have millgrain on the shanks around the head and down the shank at different lengths and patterns. It is especially useful when enlarging a millgrain wedding band. You must be able to match the added piece to the ring, then match the millgrain edge with the millgrain tool so it is not noticeable where the piece was added. A good amount of pressure is needed when rolling this edge which is why a handle the shape of a graver handle is needed to be able to adequately control the tool and make a good job of making the millgrain edge.

Figure 2



DRAWPLATES & TONGS

Drawplates and tongs (Figures 2D and E) are a convenience to have but not a necessity. Wires can be purchased in most any diameter you possible need, but having them can save waiting on orders to come in or carrying a large stock of precious metal wire. Drawplates are made in many sizes with different size holes to draw the wire through for reducing the size (diameter). The holes are tapered. When the wire is drawn through one hole and needs to be smaller it can then be drawn through the next hole smaller, and so on, until it is reduced to the diameter desired. Before reducing the diameter of wire it must be annealed to a dead soft condition by heating to a cherry red and either slow cooling or quenching if the metal is a nonferrous metal such as gold, silver, nickel siver, brass, or platinum. If steel, it must be slow cooled after heating a cherry red.

The end to be started through the drawplate should be filed to a taper so it will extend through the drawplate far enough to get a good grip on it with the draw tongs. The drawplate needs to be held solid while pulling the wire through it. It can be held solidly by clamping it in a mounted bench vise that is mounted on a solid bench. After pulling through each time, the wire should again be annealed if it seems to have hardened. Experience will teach how often to anneal. The metal used, the thickness of the metal, and how many draws need to be made are all factors in how hard the metal will be after each draw. Figure 2F, Point a shows the taper in the hole of the drawplate; Point b shows the wire; and Point c shows the tapered end of the wire protruding through the drawplate where it will be grasped by the tongs to pull it through, thus reducing the diameter of the wire. Figure 2D shows drawplate, and 2E shows the draw tongs. Especially gold wire can be drawn to several times its original length if adequately annealed between draws.

Although craftsmen with a good reputation for producing quality work usually have more work then they can handle, they often are left with too little time to use a drawplate or work their scrap gold into useable sheets, bars, or ingots. Doing these things gives me a great amount of satisfaction and pleasure, while at the same time I save much money that the fabricated metals cost as well as the cost of a large inventory of precious metal. It seems that this is a matter of choice of what can be considered priorities.

Next article: fitting stones in settings. HT

GEMSTONES

Edgar Cleves, Jr.

SODALITE GROUP

The minerals in the sodalite group are sodalite, hauynite or hauyne, noselite or nosean, lazurite and hackmanite. The gem called lapis-lazuli, or sometimes lapis, is a rock composed of sodalite, hauynite, nosean and lazurite. The finest lapis-lazuli is the solid deep blue with just a sprinkling of yellow pyrite. The name is derived from the Persian word *lazhward*, meaning blue. The finest specimens are found in Afghanistan and Pakistan. It is used mostly in men's jewelry. It takes an excellent polish and does not show wear.

Sodalite is usually a bright blue mottled gem. It is a sodium aluminum silicate with chlorine. The chemical formula is $Na_4Al_3Si_3O_{12}Cl$. It was named because of the large content of sodium. It occurs in igneous rock which is rich in sodium. It is found in ragged patches and various size masses usually along cracks and fissures.

Sodalite should not be used in jewelry that is exposed to hard wear. It is not durable and can easily be damaged because it contains a large number of dodecahedral cleavage planes. The hardness varies from 5½ to 6. It forms in the isometric system and therefore has only one index of refraction, which can vary from 1.483 to 1.487. It displays conchoidal to uneven fractures. The luster is greasy to vitreous. The specific gravity is 2.2 to 2.4. It varies from transparent to opaque, transparent specimens being vary rare. It is found in colorless, greenish, whitish, reddish and yellowish; however, the most abundant is light to dark blue.

Sodalite closely resembles lapis-lazuli and sometimes has been mistaken for it. It is deserving of greater recognition. It is easy to cut, which makes it desirable for hobbyists. In the United States it is found in Arkansas, Colorado, Maine, Montana, Massachusetts, New Hampshire and South Dakota. In Canada it is found in the Northwest Territories and Quebec. Other deposits are in Brazil, French Guinea, Greenland, India, Norway, Russia and Scotland.

Lazurite is another member of the sodalite group. It is found in medium to deep blue, greenish blue and violet blue with streaks of light blue. The chemical formula can be $(NaCa)_8$ $(AlSi)_{12}O_{24}(S, SO_4)$ or $(NaCa)_8(Al_6Si_6O_{24})$ (S, SO_4Cl). It forms in the isometric system. Dodecahedral crystals up to 2 inches have been found, but they are very rare. It is usually massive and compact and found in veins. In its pure state the specific gravity is 2.38 to 2.45. Gem quality can be 2.7 to 2.9 and even higher if large amounts of pyrite are present. It is singly refractive and the index of refraction is 1.50. The luster is dull and the hardness is 5 to 6. White calcite and pyrite are found in many specimens. A drop of hydrochloric acid will release a hydrogen sulfide gas. It may fluoresce in long or short wavelength ultraviolet light.

It is found in the oldest operating mine in the world in Badakshan, Afghanistan, whose history goes back 7,000 years. This mine is also the source of the world's finest lapis. Lazurite is also found in Burma, Chile, Italy, Labrador, Mogok, Mongolia, and Pakistan. In the United States it is found in California and Colorado.

Hauynite or hauyne is one of the major constituents of lapis-lazuli. It is rarely found as a distinct gem. The deep blue is the most sought-after color because of its beauty. However, it can also be found in white, grey, green, yellow and red with slightly bluish to colorless streaks. It forms in the isometric system. The crystals can be dodecahedral or octahedral. The luster is vitreous to greasy. It is singly refractive with the index ranging from 1.496 to 1.505. It has one distinct direction of cleavage. It is brittle and the fracture varies from conchoidal to uneven. The hardness is 5.5 to 6.0. The specific gravity is 2.44 to 2.50. Faceted stones are rare. Since most material is opaque, it is cut en cabochon.

Hauynite was named after Rene Just Hauy, a French mineralogist who was one of the founders of the science of crystallography. Under Napoleon Bonaparte he became professor of mineralogy at the museum of natural history. He is also known for his studies in the field of pyroelectricity —the property of some crystals to develop electrical charges on heating or cooling.

Hauynite is found in alkaline igneous rocks in Colorado, Montana and South Dakota. Other sources are located in Canada, France, Germany, Italy and Morocco.

Noselite or nosean is found as greyish crystals in lavas exploded from volcanoes in the Eifel, which is a region in Germany lying between the Rhine and Moselle Rivers and the Luxembourg frontier. The area is an ancient massif of slates, sandstones and limestones. The chemical composition is $Na_8(Al_6Si_6O_{24})$ (SO_4). The index of refraction is 1.495 and the specific gravity is 2.30. The hardness is 6. The crystal structure is usually obscure, but takes the form of dodecahedral or octahedral. It can also be easily damaged because it contains a large number of dodecahedral cleavage planes. Hydrochloric acid will release a hydrogen sulfide gas. It is found in the same locations as sodalite.

As a final comment, there is a variety of sodalite which is rich in sulphur and not common. It is called hackmanite. There is very little information available at the present time. It is mined in Ontario, Canada. It fluoresces bright pale pink in ultraviolet short wavelength and bright yellow-orange in long wavelength. The gem is white. It may turn red after being exposed to short wavelength light. The color will fade in sunlight. Sodalite is very readily available in Canada and is the national gemstone of our northern neighbor. HT

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Affiliate Chapter Column

Thomas H. White

PLEASURE

You can tell a great deal about the character of a man by knowing the things in which he takes pleasure. Or can you? You might have thought that you knew the boys and girls with which you associated or attended school when you were young. Some you did know well, and they are still the strong persons you thought them to be. Others were not, and a few perhaps fooled you.

What is *pleasure*? Dictionaries have a tough time with this word, as they do with any abstract noun. *Pleasure* is an *agreeable emotion accompanying the possession or expectation of what is good or greatly desired.* If you look up *agreeable,* you will find *pleasing.* If you look up *pleasing,* you will find *giving pleasure, agreeable.* So much for definition!

The definition does one thing, however; it points out that pleasure is related to what a person wants or expects out of life. By watching what a person takes pleasure in, then we can obtain a glimpse of his or her values–what is really important to that individual.

What gives you pleasure?

People might list sports, hunting, fishing, job, sex, good relationships, family, and so on. Some might admit to not finding pleasure in anything–all of life has become flat or depressing for them. Most people, however, can find pleasure in SOMETHING.

I know there is someone in your guild that would find pleasure in attending the AWI Affiliate Chapter meeting in June this year. This is the time to bring it up at your meeting. The more you can say concerning this subject, the more informed we become. This is the way to get the membership talking and thinking, and to provide the preliminary push necessary to prompt some kind of action in order to bring delegates to the convention.

Encourage the board of the guild to make recommendations from those members that are active or might be able to arrange for the time off. When asked to be a delegate and given encouragement and support, they may find a way to attend. Perhaps the board could come up with some financial help. There are a lot of hours donated to the guild meetings by those volunteering as officers, board members, those putting on programs, and the refreshment committees. If you have members that are interested, then it's you duty to find them and suggest to them that they be delegates to the national convention. Find the *pleasure* and you will have the delegates.

NEWS ...from all around the ASSOCIATION...

NEW JERSEY

Lou Zanoni of Zantech presented a program on the evolution of the quartz watch for the February 9th meeting of the Watchmakers Association of New Jersey. Specifically, Mr. Zanoni's subject was the development of technology for the watch display. He explained that although the circuits existed, displays continued to be a problem for designers of the early quartz watches.

He showed slides of the early stages of development, including the 1971-72 period. Some of the material in his collection will be donated to the Smithsonian. He also brought a group of early quartz watches for all to see.

CALIFORNIA

The San Diego Horological Society travelled to the Los Angeles area recently to tour the Hattori Corporation of America's Coserv Service Center in El Segundo, CA. This informative trip was sponsored by Gateway Time, the Seiko watch and clock distributor for the Southern California area.

The tour of the facility, a first both for the Horological Society and for Gateway, "gave all parties a foundation for understanding each other's mutual concerns," said Carl Goldberg, president of the Society. The San Diego group witnessed the entire service process from the consumer repair department to the shipment of Seiko Product to Southern California retailers.

Larry Moore, Coserv's Senior Technical Advisor for the Oakland office, conducted a technical seminar following a luncheon for the group at the Marriot Courtyard Hotel.

UPCOMING CONVENTIONS AND MEETINGS

Iowa Jewelers & Watchmakers Association
Spring Seminar
April 10, 1988
Airport Hilton Inn – Des Moines, IA

Missouri Jewelers and Watchmakers Association
1988 Convention
April 15-17, 1988
Capitol Plaza Hotel – Jefferson City, MO
Information: (913) 381-2033

Horological Association of Indiana Spring Workshops
April 24 – Lafayette, IN
May 15 – Jasper, IN

Wisconsin Horological Society
53rd Annual Convention
April 29, 30, May 1, 1988
Holiday Inn – Oshkosh, WI

Horological Association of Virginia 1988 Convention
April 29, 30, May 1, 1988
Cavalier Hotel – Virginia Beach, VA

Texas Watchmakers Association 41st Convention
May 20-22, 1988
Kahler Green Oaks Inn – Fort Worth, TX

Arizona Horological Association Convention
May 21-22, 1988
Embassy Suites Hotel – Scottsdale, AZ

Watchmakers Association of Pennsylvania Convention
June 10-12, 1988
Lancaster, PA

Watchmakers Association of Ohio Convention
July 22-24, 1988
Parke University Motel – Columbus, OH

Nebraska & South Dakota Jewelers Association
83rd Annual Convention
August 26-28, 1988
Midtown Holiday Inn – Grand Island

Iowa Jewelers & Watchmakers Association
Convention & Trade Show
September 10-11, 1988
Airport Hilton Inn – Des Moines, IA

SCHOLASTICALLY SPEAKING

Dwight Tubb

So, You Want To Be a Watchmaker...?

I'm convinced that the larger portion of beginning horology students have a very muddled perception of where they will wind up in the watchmaking marketplace and, for that matter, whether or not they will be able to be successful–period. Virtually all of them look for guidance and counseling. Most of them look for encouragement. What it all boils down to is that at the beginning of school, a student can't really know how well he or she will do in school, and at that moment in time cannot possibly predict how good of a watchmaker is locked up inside of him or her.

We teachers try to advise and encourage new students, but there are no easy answers. We want more students but must also point out to these prospective watchmakers that "not everyone has the ability to be a watchmaker." Their natural response is to ask what it takes to be a watchmaker. Along about that time is when I begin to think how silly I must look with my foot in my mouth.

What I am about to say should not be interpreted as minimum requirements for entering a school of horology. It should also not be construed as attributes that would guarantee someone success in school or later on in their watchmaking career. What follows is simply my idea of basic attitudes and attributes that make for easier transition into our magical little world we call watchmaking.

NUMBER ONE: A reasonable amount of problem-solving ability. This has nothing to do with artistic skill. It simply points out the need for a watchmaker to be able to make decisions (troubleshoot) based on given facts. Most people know that 2 plus 2 equals 4. Based on this fact, can we not assume that 4 minus 2 equals 2? The prospective watchmaker needs to have some kind of a track record in placing things in a logical order.

Problem-solving is somewhat like when a young man asked his girlfriend's father for her hand in marriage. "So," her father said, "you wish to become my son-in-law?"

"That wasn't the main idea," the young fellow said, "but I don't see any way out of it if I'm going to marry your daughter."

NUMBER TWO: A basic ability to develop good eye-to-hand coordination. Problem-solving will tell us what to do, but can our hands do what our eyes and brain tell us must be done? Don't worry too much if you can't thread a needle very easily. If you can't thread a needle under a 5X loupe, however, you may not be the best candidate in the world for watchmaking school.

NUMBER THREE: The ability to read at least on a tenth-grade level. Most horological books and technical bulletins are written on a fairly simple level. A good vocabulary and reading comprehension abilities will certainly make the educational process easier. May I also add that the person who cannot read will be at a tremendous disadvantage once hired in the watchmaking marketplace.

NUMBER FOUR: A basic perception of true precision. A watchmaking student will soon be required to understand the importance of 1/100th of a millimeter. It is many times harder for someone unfamiliar with horology to fathom the minimum and maximum tolerances of everyday watchmaking. The prospective student will have to at least be conducive to this philosophy.

NUMBER FIVE: An appreciation for patience and a forbearing attitude. This walks hand in hand with Number Four. If you recognize what true precision is, you must then be willing to stick with the job until you meet those tolerances. It also points to a desire to do the best you possibly can whatever the circumstances.

I would point out once again that these are not guarantees of success nor are they minimum requirements. They are certainly things that I look for and hope to see when I meet a prospective horology student. If they can be found, my job will be a lot easier and the chances of success for this person will be much greater.

If you happen to know anyone that fits the bill, *please* send them to the nearest horology school.

Distributors Aid AWI Membership Drive

The strength and success of any organization is in the number of members it has and the financial support it receives from them. Each year AWI solicits new members by mailing membership brochures to potential members. This year the distributors listed below gave their cooperation by volunteering to stuff membership brochures in mailings they made to potential members. We express our thanks to them and thought you would want to know who they were.

- Akron Jewelers Supply Co.
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New Products/News in the Trade

THE CONQUEST 1000 Oe FROM LONGINES

The Longines Watch Company (St-Imier, Switzerland) has added a revolutionary new timepiece to its leading range: the Conquest 1000 Oe. This has been called a high precision watch (+/– 1 minute in five years), "super-antimagnetic" and far above average standards.

"Oe" is an abbreviation of Oersted, the unit of measurement for the intensity of a magnetic field. The new Conquest is therefore designed to resist an intensity of 1000 Oe as against 40 Oe for a conventional quartz watch which, if it is placed on the loudspeaker of a 9V transistor radio, will be subject to 120 Oe; its stepping motor may then jump one or two impulses, which will affect its rate.

Longines' 1000 Oe is designed for people whose work frequently exposes them to strong magnetic fields: research scientists, engineers, radiologists, radio and TV broadcasters, and computer operators, among others. To guarantee the performance of its new watch, Longines has fitted it with its VHP (Very High Precision) movement, which is accurate to within one minute in five years. The rate of the quartz which regulates it is permanently supervised, via a microprocessor, by a high frequency quartz which eliminates the effects of temperature variations. Secondly, it has a "superantimagnetic" screen: the VHP movement is inserted between two shells of soft iron, inside which there is also a layer of synthetic insulating material. Iron is used because, in its pure state, it does not become magnetized and does not conduct magnetism. The Longines-made titanium case is water-resistant to 10 atm, and the titanium bracelet is made of rolled gold links.

For more information, contact: **Longines-Wittnauer Watch Co., 145 Huguenot, New Rochelle, NY 10802; (914) 576-1000.**

ABRASIVE CORDS FINISH INTRICATE SETTINGS

A complete line of flexible, small diameter abrasive cords that can be used by hand or with piercing saws is available from E.C. Mitchell Co., Inc. of Middleton, MA. These abrasive cords are impregnated with aluminum oxide, silicon carbide, or crocus for ultrafine polishing. They are flexible enough to finish intricate settings and under bezels obstructed by ring shanks. They can be used by hand or with piercing saws.

Available in 12 different sizes from 0.012" to 0.150" diameter, the cords come packaged on 25-yd. spools. Flat tapes are also offered in 1/16" to 1/4" widths and frequently eliminate hand filing, claims the maker. They are priced from $10.50 per spool, and quantity discounts are available. Samples will be provided on request.

For more information contact: **E.C. Mitchell Co., Inc, Everett Mitchell Marketing, 88-90 Boston St., P.O . Box 607, Middleton, MA 01949; (617) 774-1191.**

RIO GRANDE ALBUQUERQUE'S 1988 TOOLS CATALOG

Rio Grande Albuquerque's 1988 Tools catalog features 338 new items for the jeweler. There are 180 pages filled with tools, equipment, and supplies. For a free copy call toll free at **1-800-545-6566** or write **Rio Grande Albuquerque at 6901 Washington Northeast, Albuquerque, New Mexico 87109.**

GESSWEIN KILNMINDER II

Gesswein's new Kilnminder II is an advanced, accurate, and versatile temperature controller. This second generation Kilnminder has delay start, plus 10 temperature and duration settings. It is completely programmable and adaptable to practically any furnace for perfect, consistant burnouts. It is the first controller that can be programmed to run in perfect sync with any furnace. Nine different options allow you to program the specifications of your furnace for precisely synchronized burnout. This results in more consistent, accurate, and better detailed castings. Kilnminder II's microprocessor will store your burnout cycle in permanent memory until you decide to change it. Kilnminder comes pre-programmed, ready to use, or you can set up your own program in minutes.

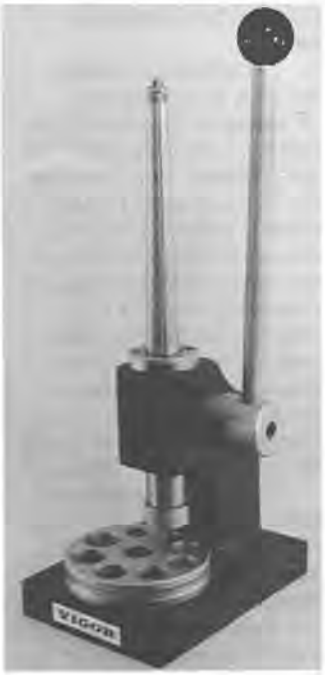
For further information contact **Gesswein, P.O. Box 3998, 255 Hancock Avenue, Bridgeport, Connecticut 06605; (203) 366-5400.**

VIGOR RING SIZER

B. Jadow and Sons, Inc. has introduced a new Ring Sizer (RN-600) to its Vigor® line of tools and equipment. This easy-to-use, Italian-made Ring Sizer enlarges and reduces rings quickly and will not scratch or mar rings. Its expanding steel mandrel is

upright to save bench space and accommodates ring sizes 3 to 15. The reducing ring contains 16 countersunk, finished holes. This tool enables you to provide an ideal service to customers and lets you carry a smaller ring inventory.

The Ring Sizer RN-600 is available from your Vigor distributor, or contact **B. Jadow and Sons, 53 W. 23rd Street, New York, NY 10010-4275; (212) 807-3800.**



KASSOY 1988 CATALOG NOW AVAILABLE

Kassoy has announced the publication of its 1988 full color catalog. There are 60 separate categories of tools, scales, optical merchandise, testing equipment, cleaning equipment, tagging and bar coding systems in this catalog. Kassoy has been serving retailers, manufacturers, diamond and stone merchants since 1936.

Catalogs can be obtained by contacting: **KASSOY, 28 W. 47th St., New York, NY 10036; or call toll free 1-800-4-KASSOY, in New York State call 1-212-719-2290.**

COMPLEX WATCH FROM GIRARD-PERREGAUX

Girard-Perregaux has introduced an automatic chronograph with small seconds, 30-minute and 12-hour totalizers, and a date calendar. The water-resistant cases, with engraved tachymetric scale, are available in 18K yellow gold, pink gold, or two-tone silver and pink gold.

For more information contact: **Girard-Perregaux, P.O. Box 1245, Englewood Cliffs, NJ 07632; (201) 568-4920.**

CUSTOMIZED NEWSLETTERS FROM CREATIVE WRITING SERVICES

Creative Writing Services of Huntington Woods, MI now offers jewelers customized newsletters for distribution to their customers and employees. Newsletters provide the perfect balance between institutional and hard-sell advertising. These attractive customized letters, complete with a masthead created especially for each jewelry store, provide "newsy" tips about jewelry care and cleaning, shopping, and appraising tips, and also allow plenty of space for customized "news" specifically about the store and space for regular newspaper-style ads. The Newsletter, available on a quarterly basis, comes in an 8½" x 11", four-page format, on a flat finish paper stock, in the jeweler's choice of color.

Contact **Denise Rodgers (313) 542-4012** or write: **Creative Writing Services, 13303 Hart, Huntington Woods, MI 48017.**

SEIKO MANTEL CLOCK

Seiko's elegant arched mantel clock is an impressive celebration of time. This memorable timepiece lends distinction to any setting with its black-on-gilt styling. A sleek black dial is marked with gilt Roman numerals, and is gracefully centered over a delicate rotating pendulum. All is framed with a gold-tone arch that will make a lasting impression. Seiko's arched mantel clock is available through the nationwide network of authorized Seiko distributors.

GESSWEIN CASTING CLASS APRIL 22 & 23, 1988

Gesswein will be offering a 2-day seminar covering every step of the jewelry casting process. This hands-on class will be held at Gesswein's headquarters in Bridgeport, CT; instruction will be provided by Gary W. Miller, Gesswein's technical advisor.

The attendees will be shown how to make a model, and then brought through the mold making, vulcanizing, wax tree, investing, burnout, and casting processes. Everyone will be given the opportunity to perform these jobs themselves with Gesswein's casting supplies, tools, and equipment. Instruction will be geared to both the novice and the experienced caster who may be experiencing problems with his castings or would like to learn new techniques.

Gesswein's casting seminar is scheduled for April 22 and 23, 1988. Enrollment is limited to 20 people in order to provide individual attention. A fee of $250 includes 2 days of instruction on the entire casting process, all materials, and lunch. Reservations can be made by contacting **Gesswein, 255 Hancock Ave., Bridgeport, CT 06605; (203) 366-5400, ext. 265 (Elaine Corwin, technical dept. manager).**

GIA SPONSORS SOUTH AMERICAN TOUR MAY 15-28

The Alumni Association of the Gemological Institute of America will embark on a two-week tour of South American gem centers from May 15-28, 1988.

The tour will leave from Los Angeles for Rio de Janeiro and environs, where group members will spend six days visiting gem dealers and exporters, the Mineral Museum, the Mines and Energy Ministry, and the Rodrigo Silva topaz mine in Ouro Preto.

Subsequent stops in Peru will include Lima and Cuzco and a train ride to the Incan ruins at Machu-Picchu. The trip will conclude with a visit to emerald dealers in Bogota, Colombia, and the famous Gold Museum there.

"This has always been one of the most popular tours we offer," says Bob Earnest, tour leader and GIA Alumni Association Executive Director. "It's a gemological education, a buying trip, and a great vacation—we've found it to be a winning combination for a lot of people."

The tour is open to all. For daily itinerary and details on cost and GIA Alumni Association member discount, contact: **Bob Earnest, GIA Alumni Association, toll-free nationwide (800) 421-7250, ext. 279; outside U.S. call (213) 829-2991, ext. 279.**

BULOVA APPOINTS DAVID WINKLER VP/MERCHANDISING

David A. Winkler has been named Vice President/Merchandising for the Bulova Watch Co. Winkler, who oversees product line planning, design and development for the Bulova, Caravelle® and Ultime® watch brands, joined Bulova in 1984 as Merchandising Manager. In 1986 he was promoted to Assistant Vice President. Prior to Bulova, he served as Director of Product Development for the Longines-Wittnauer Watch Co.

A graduate of New York University, Winkler resides in Bethpage, NY.

David A. Winkler

BULOVA NAMES JOHN VAN INGEN VP/PURCHASING

John Van Ingen has been appointed Vice President/Purchasing by the Bulova Watch Co.

Responsible for the Product Purchasing of all brands, Van Ingen joined Bulova in 1979 as Director of Purchasing, and was promoted to Assistant Vice President in 1984. Before coming to Bulova, he served as Manager Purchasing with I.T.T. Corporation for 10 years.

Van Ingen holds a B.S. degree in Business from S.U.N.Y. and is a member of the National Association of Purchasing Management and the Purchasing Management Association of New York.

Jon Van Ingen

GEORGE MEFFERT APPOINTED EXECUTIVE VP EVEREADY BATTERY CO.

George L. Meffert, Jr., Chairman of Eveready Battery, has been appointed to the position of Executive Vice President. The announcement was made by J. Patrick Mulcahy. In his new position, Meffert will be General Manager of Eveready Battery Company and will have direct responsibility for marketing and sales.

Meffert received his Bachelor of Science degree in Business Administration from Florida State University in 1965. He joined Eveready in 1965 and has held several positions of increasing responsibility during his career with Eveready. In his new position, Meffert will headquarter in St. Louis and report to Mulcahy.

$1,000,000 JUDGMENT STANDS AGAINST HOLMES PROTECTION

In the first successful case of its kind in the state, the New York Court of Appeals refused to hear an appeal by Holmes Protection, Inc., from a $905,933.23 judgment in favor of Rand & Paseka Mfg. Co., a jewelry manufacturer. The judgment followed a jury verdict based on a finding of gross negligence. By refusing to hear the appeal, the Court of Appeals in effect sustained the jury's finding.

According to attorneys Norman A. Senior and Gary B. Freidman of Greenfield Eisenberg Stein & Senior, representing Rand & Paseka, "This is the first New York case where an alarm company customer successfully overcame the limitation of liability clause found in every alarm company contract. The jury found that not only did Holmes breach its contract, but that it was grossly negligent in the performance of its duties by failing to respond to the alarm at Rand's premises for more than 11 hours."

Rand & Paseka operated a jewelry manufacturing business at 153 Waverly Pl., New York, NY. Burglars entered the premises on a Saturday afternoon in March, 1979. Although the alarm system notified Holmes' personnel of the unauthorized entry, the alarm company failed to respond. Meanwhile, the burglars emptied the contents of two safes and removed approximately 430 pounds of gold. They carried the gold down ten flights of stairs and escaped.

Eleven hours after the alarm system indicated unauthorized entry, Holmes finally decided "something suspicious" was taking place at Rand & Paseka. Two guards were dispatched to investigate. Upon arrival, the guards discovered the burglary and called the police. The value of the stolen gold exceeded $1,000,000, making it the then largest gold burglary in New York City history.

Classified Ads

REGULATIONS AND RATES

Ads are payable in advance $.50 per word, $.60 per word in **bold type.** Ads are not commissionable or discountable. The publisher reserves the right to edit all copy. Price lists of services will not be accepted. Confidential ads are $4.00 additional for postage and handling. The first of the month is issue date. Copy must be received 30 days in advance. (e.g. February issue closes for copy on January 1st.)

HOROLOGICAL TIMES, P.O. Box 11011, Cincinnati, OH 45211; (513) 661-3838.

For Sale

W/W MOVEMENTS–Font 69, 6¾x8L, W/SS, 17J, NEW––$7@, 6/$36, 12/$60, plus $3 for shipping & handling. 1(215) 377-3041.

Boley High Precision Lathe catalog number LA-709, LA-711 accessories, LA-775 chuck, LA-718 slide rest, LA-722 wheel cutting attachment, many extras, sell for ⅓ of today's price. Boley WW Model LA-700 Lathe, motor, stand, collets: $260.00. Branson Model 220 Ultrasonic Cleaner: $90.00. K&D Standard Inverto Staking Tool: $65.00. Seitz Jeweling Tool, all pushers, reamers, anvils: $110.00. Jacot Bow Lathe: $25.00. Hamilton 21 Ship Chronometer, 3 tier case, carrying case, history, books: $1150.00. Other lathes, tools, and parts –too much to list. Send self-addressed stamped envelope for list. H.N. WEBSTER, 3700 Hall Ave., Sebring, FL 33872; phone (813) 385-8924.

BE ALL THE CLOCKMAKER YOU CAN BE! Thornton Cutters in stock. KEN LAW, CMC–H.C. 30, Box 825, Prescott, Arizona 86301.

VIBROGRAPH M80, used 2 hours, $700.00, or offer. D. Arnold, 6240 Chambersburg Rd., Fayetteville, PA 17222; (717) 352-2728 days.

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Seitz Friction Jeweling Set/accessories, like new, $200.00. K&D Staking Tool set/accessories, good condition, $400.00. M80 Vibrograf Timing Machine, like new, $550.00. Contact: CORDES, (813) 763-0923; 13465 SW 16th Drive, Okeechobee, FL 34974.

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CLOCK TIMER. Regulate your clocks electronically with the new CTI Clock Timer. Can be used on almost any clock with mechanical escapement. Pendulum clocks large and small, lever or cylinder escapements, anniversary clocks, etc. For information write: Can Tho Instruments, P.O. Box 80113, San Diego, CA 92138.

Books

NOTICE

SOMETHING NEW!!!

In AUGUST be sure to look in our 1989 Clock & Watch Book Catalogue containing

NEW SOURCES

for your horological buying and selling needs.

You still have time to place an ad if you hurry and we receive it by June 1st, 1988.

For further information call Tran Duy Ly at (1-703) 280-2005 or write Arlington Book Co. P.O. Box 327, Arlington, VA. 22210-0327

Schools

Correspondence courses in Quartz–Accutron–Watchmaking–Jewelry–Lost Wax Casting–and Rubber Mold Making. Free folders. Watchmaking Institute of Canada, 1012 Mt. Royal St. East, Montreal, H2J 1X6; (514) 523-7623.

Tradesman

TRADE WATCHMAKER – Servicing Quartz Analogs & Mechanicals. Send SASE for details to: Glenn Swafford, CMW, 1113 Centennial Drive, Fort Washington, MD 20744, or call after 6 pm EST (301) 248-1508.

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CLOCK and MUSIC BOX parts, mainsprings, material and tools. Custom made to order or repair of gears, pinions and parts. Catalog $2.00. TANI ENGINEERING, Box 338, Atwater, OH 44201. (216) 947-2268.

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WANTED: Quality watch repair, all types, CAT, for experienced watch repairmen looking for trade work. Experienced in quartz repair. Fast turn-around, quality trade work. Free telephone return estimates. Contact: Tim Ball, TRISTATE WATCH REPAIR, P.O. Box 786, Dyersburg, TN 38024; call collect (901) 285-5437 for further information.

CLOCKS: gearcutting, retoothing, repivoting, rebushing, jeweling. REPAIRING: Chronographs/timers, fusees, aircraft clocks, antique clocks/pocket watches. Send sample for estimate, SASE.–NIEGELS HOROLOGY, Roy Niegel, CMC, CMW, 101 E. St. Joe Drive, Spirit Lake, ID 83869. (208) 623-4330.

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MECHANICAL & QUARTZ WATCH REPAIR. Ken Crawford, 2100 Crampton Rd., Lynchburg, Ohio 45142. (513) 364-6198 evenings.

Cylinder escapements restaffed in platforms and watches. Write for shipping instructions. KEN LEESEBERG, RR 4, Box 286, P.O. Box 447, Montello, WI 53949.

CLOCK MOVEMENTS rebushed & pivots refinished. Same week service. Free UPS, factory authorized. Two-year warranty. Butterworth Clock Repair, 1715 Pearlview Ct., Muscatine, IA 52761. (319) 263-6759.

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WANTED: WITTNAUER WRISTWATCH, model 11WE-1 electric cut-away dial. Price, condition. NIEBLING, 303 Suffolk Rd., Flourtown, PA 19031.

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Dates to Remember

APRIL 1988

10—Iowa Jewelers and Watchmakers Association Spring Seminar; Airport Hilton Inn; Des Moines, IA.

15-17—Missouri Jewelers and Watchmakers Association, Inc. 1988 Convention; Capitol Plaza Hotel; Jefferson City, MO. Information: Sharon Blair (913) 381-2033.

17—Allegheny Watchmakers Guild of the Watchmakers Association of Pennsylvania All-Day Seminar; Oxford Center; Pittsburgh, PA. Information: (412) 322-6106 or (412) 486-8409.

23-24—Watchmakers Association of Ohio Quarterly Meeting; Parke University Motel; Olentangy River Road; Columbus, OH.

24—Retrofitting Bench Seminar (AWI); James Broughton, instructor; Lafayette, IN.*

24—Horological Association of Indiana Spring Workshop; Lafayette, IN. Information: P.O. Box 723; Shelbyville, IN 46176.

29-20-May 1— 53rd Annual Convention of the Wisconsin Horological Soceity; Holiday Inn; Oshkosh, WI.

29-30-May 1—Horological Association of Virginia Annual Convention; Cavalier Hotel; Virginia Beach, VA.

MAY 1988

7-8—Restoration of Fusee Watches Bench Seminar (AWI); Ralph Geiger, instructor; Reading, PA.*

15—Horological Association of Indiana Spring Workshop; Jasper, IN. Information: P.O. Box 723; Shelbyville, IN 46176.

15—Retrofitting Bench Seminar (AWI); James Broughton, instructor; Jasper, IN.*

20-22—Texas Watchmakers Association 41st Convention; Kahler Green Oaks Inn; Fort Worth, TX.

21-22—Arizona Horological Association Convention; Embassy Suites Hotel; Scottsdale, AZ.

JUNE 1988

3-5—Kansas Jewelers Association, Inc. Convention; Holidome; Hutchinson, KS. Information: Sharon Blair (913) 381-2033.

10—Retrofitting Bench Seminar (AWI); James Broughton, instructor; Lancaster, PA.*

10-12—Watchmakers Association of Pennsylvania Convention; Lancaster, PA.

21-23—Research and Education Council Annual Meeting, Drawbridge Inn and Convention Center; Ft. Mitchell, KY. For more information contact AWI Central.

24—AWI Annual Affiliate Chapter Meeting; Drawbridge Inn and Convention Center; Ft. Mitchell, KY. For more information contact AWI Central.

25-26—American Watchmakers Institute (AWI) Annual Board of Directors Meeting; Drawbridge Inn and Convention Center; Ft. Mitchell, KY. For more information contact AWI Central.

JULY 1988

22-24—Watchmakers Association of Ohio Annual Convention; Parke University Motel; Olentangy River Road, Columbus, OH.

AUGUST 1988

6-8—1988 Heart of America MINK Jewelry Show; Doubletree Hotel; Overland Park, KS. Information: Sharon Blair (913) 381-2033.

7-8—Illinois Jewelers Association Chicago Show; Holiday Inn Mart Plaza/Expo Center; Chicago, IL. For more information: Jack Thompson, Convention Manager; 111 E. Wacker Dr., Suite 600; Chicago, IL 60601; (312) 644-6610.

26-28—Nebraska & South Dakota Jewelers Association 83rd Annual Convention; Midtown Holiday Inn; Grand Island.

SEPTEMBER 1988

8-11—Intermountain Jewelers Association's 27th Annual Convention; Jackson Hole Racket Club Resort; Jackson Hole, WY. For information: Ann Marie Molenaar-Schram, 1439 SW 4th Ave., Ontario, OR 97914. (503) 889-3213.

10-11—Iowa Jewelers & Watchmakers Association Convention and Trade Show; Airport Hilton Inn; Des Moines, IA.

18-19—Management Seminar (AWI); Fred Burckhardt, instructor; San Francisco, CA.*

OCTOBER 1988

8-9—Restoration of Fusee Watches Bench Seminar (AWI); Ralph Geiger, instructor; Chicago, IL.*

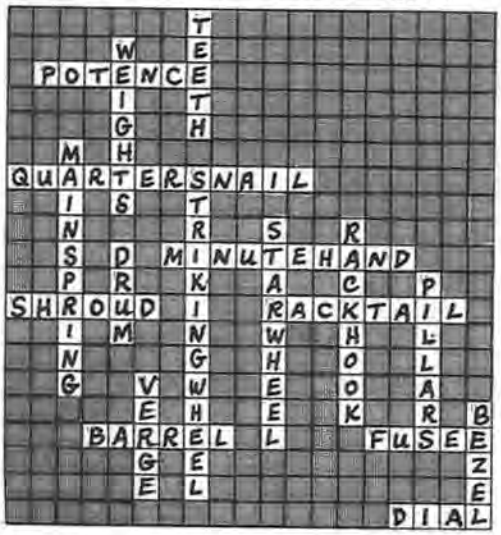
14-16—Antique Watch Restoration Bench Seminar (AWI); Archie B. Perkins, instructor; Boston, MA.*

* Contact AWI Central for more information.

Ad Index

ANSWERS

(Horological Crossword Puzzle on Page 22)



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