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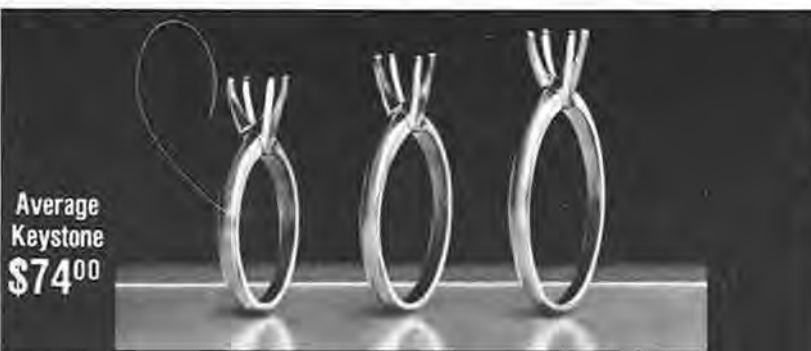
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# HOROLOGICAL TIMES™



Official Publication of the American Watchmakers Institute

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# HOROLOGICAL TIMES™

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Marvin E. Whitney

## Editorial

It's difficult to get a consistent method from any two clockmakers as to how they very efficiently clean a clock. From checking around, never has it been accepted that any one clockmaker has the chemicals nor the method that a high percentage of clockmakers accept as state of the art in this ever increasing business.

But don't mess around with the watchmakers by saying that they don't have specific routines with their cleansing operations. They'll tell you about different machines, different solutions, and different this and that, but all seem to fall into a fairly general category of clean, rinse, and dry with a limited selection of commercial chemicals. Fortunately, watchmakers are blessed with equipment, because of smaller size, that is designed specially for the cleaning of watches. Strangely enough, a clockmaker has spoken of cleaning clocks in the old style wringer washing machine. How that is accomplished must be a mystery to many. Even a step further before tumbling from the edge of the earth is the clockmaker that advocates the cleaning of clocks in an automatic dishwasher. He even insists that a particular dishwashing detergent be used.

Far be it for this humble message maker to suggest that it is long past due that the clockmakers of the world have a hit and miss non-method of sterilizing the objects of their trade. If indeed there is an accepted procedure in the cleaning of clocks, what a gift would be presented to the clockmakers of the world, not to speak of their customers.

Tell us your method. We'll listen.

---

**ON THE FRONT:** These fragrant flowers are always an indication of early Spring. Called "cowslips," flowers of this kind are also seen in purple. Photograph by Stephen Hammond of Oshkosh, Wisconsin.

# POWER SELL



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**maxell.**



# A Message from the ELM Trust

By Robert Nelson

**T**he letters ELM are familiar to most AWI members; however, many may not understand its purpose. The official name is The American Watchmakers Institute Educational, Library and Museum Charitable Trust. Obviously, the letters ELM represent Educational Library and Museum.

It is a charitable trust under Section 501 (c) (3) of the Internal Revenue Code giving it a Tax Exempt Status, also permitting it to issue receipts for contributions which are tax deductible for the donor. All its income must be spent for "charitable" purposes, as defined "to aid in advancing the art and science of horology".

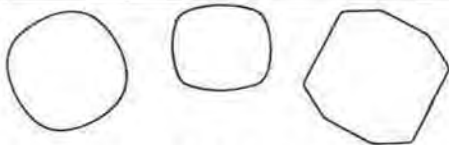
The Trust operates within the AWI but is managed by five Trustees independently of the AWI. The Trustees are appointed by the President of the AWI and the Executive Committee. They must be ratified by the AWI Board of Directors.

The purpose and activities of the Trust are: 1) to lend assistance to schools of horology, 2) to maintain a horological library, 3) to maintain a horological museum, and 4) to encourage and assist students in horology. Item 4 consists primarily of making interest free loans to worthy students needing financial assistance.

Money for the operation of the Trust must be raised independently from AWI. **NO PART OF AWI MEMBER DUES ARE USED BY THE TRUST.** The greatest source of income in recent years has come from the sale of used batteries donated by watchmakers. Some money is raised through the sale of certain horological books. Several authors are contributing their royalties.

The Trust is in great need of more financial support through contributions, memorials and gifts, all of which are tax deductible.

TIMES



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# Questions & Answers

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



## Junghans Anniversary Clock

**Q** I have a Junghans Anniversary quartz clock movement (360-1022) which the customer took apart to put a battery in. He brought it to me in pieces. I managed to get it together and it keeps time, but I cannot get the chimes to coincide with the hour. It rings at 20 minutes after the hour (it only chimes on the hour). How do I get the chimes and hands back in sync?

C. Smith Grigsby  
Mt. Carmel, IL

**A** Anniversary clocks are being produced today with chiming arrangements—after all, power reserve is no problem with these battery-driven clocks.

As for the off-time chiming, that may have occurred when the wheels were replaced with their electronic contact pads unmatched. Why not simply mount the hands to match the time that the clock strikes? In other words, when the clock strikes, mount the hour hand and minute accordingly. If that doesn't work for you, write again and we will write our contacts in Schramberg at the Junghans factory.

**Q** I have two movements that I need information on (age and history). The first movement is a pocket watch—chronograph, No. 280, approximately 46 mm, with these mark-

ings: "Ed Huguenin, Courvoisier."

The second movement has on it: "Non-Magnetic Watch Co. of America." Paillard's PAT: balance and spring; S/N 300718. It is a 16 size hunter case movement. (The books I have list only 18 size under Peoria.)

Kenneth Moser  
South Britain, CT

**A** Huguenin and Courvoisier operated in LeLocle during the 1880-1890 period. They made many types of watches. Had you sent us a sketch of the movement we would have been able to identify it closer. They also bought ebauches (raw unfinished) movements from others in town to finish with their names. That's why it is best to send as many details as possible. They generally produced middle to high grade products. The Huguenin family were prolific makers, exporting many movements.

As to the Non-Magnetic Watch Co. of America, they sold most of their products through A.C. Becken, wholesalers of Chicago. For the most part, they used the Peoria Watch Co. and sometimes the Illinois Watch movements. I also have records and had in my own possession one such marked with Paillard's patent non-magnetic balance with an Aggasiz (Swiss) movement, but marked "Non-Magnetic Watch Co. of America." Most likely, yours is a product of Peoria. Send photos of the movement for more

positive identification. These date from the 1880-1890 period.

**Q** I recently received a request to evaluate a regulator clock which had been purchased through an advertisement in a national magazine. It was described as a reconditioned antique. I believe it to be an old clock but cannot date it as I do not recognize the manufacturer. Stamped on the back plate is a heart with an "H" in it and the word "Hearth" under it. I would appreciate any information you can give me on what I presume is the Hearth Clock Co.

While I have the pen and paper out for one of my rare letters to you, I wish to express my agreement with Alton DuBois, Jr. who wrote a letter in the November issue of *Horological Times* (page 17); I'd like to give some instances to back this.

The first is the clock referred to above. I told the owner that I would not just make the clock run, I was not happy about having my name associated with it unless I could do a complete job. He agreed and I will now tell you what had to be done to put this clock in good order.

Most of the bearing holes had been peened on the inside and outside of the plates and even 3/16" OD bushings would not hide them. All the pivots had to be worked on and I needed to (Please turn to page 8)



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  - Seiko battery chart.

Kit #STK-25plus

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Hour hand holes sizes: .90, 1.00, 1.10, 1.20, 1.30, 1.40, 1.50mm.

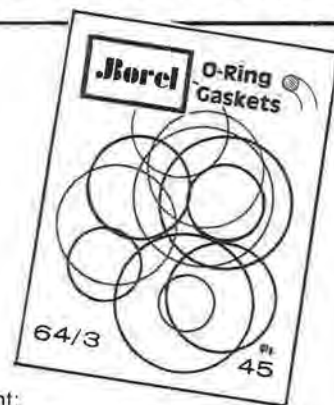
Minute hand holes: .45, .55, .60, .65, .70, .80, 90mm.

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## QUESTIONS AND ANSWERS

(Continued from page 6)

make 18 bushings. The worst butchering was to the strike mainspring arbor. It would seem that the hub that carries the main gear and ratchet had loosened and in order to effect a repair, the arbor was peened in such a manner that it was bent so that the total runout of the gear was .040". The pivots needed turning to true them to each other then turn off the main gear bearing diameter small enough to true it and leave room to drive on a sleeve with a shoulder to retain the gear. They knew that there was bad runout because the nearest pillar was filed to clear. The verge was also badly worn.

Not too long ago I was asked to look at two old clocks that had been purchased in Texas from a man who buys old clocks by the truck load, made to look presentable and sold to the unsuspecting. This fellow told them that if they put a bottle cap of kerosine in the bottom of the case there would be no need for further lubrication.

Another clock which I looked at was a small mantel clock with a very nice case. At first glance I thought it had a good movement, until I took it out of the case. I had been told that it was bought in Texas and just needed regulating. I found that the escape platform had been replaced and was apparently incorrect, as the repairman had epoxied two strips of mainspring across the balance wheel and also two lumps of epoxy on the rim of the wheel in an attempt to slow it down. The clock still gained 20 minutes a day with the regulator all the way to slow. The owner would not pay to correct.

Then there are the jewelers who would rather sell a new watch than repair the old one. Just one of many examples, a few days ago a lady asked me to look at a Bulova 5BD that had sentimental value. She had taken it to the store that had cleaned it about a year before and he told her that she could not expect it to run good in Florida as it was an Ohio watch. She should buy a new one. I cleaned and oiled it, removed some rust from the winding parts, and it is now running beautifully.

The point of all this is that over the years I have felt that too many store owners are like the ones mentioned above and are not so much craftsmen as salesmen.

Thanks for listening. I will be

interested to hear about the Hearth Clock Co.

Stanley T. Slough  
Bradenton, FL

**A** *I have read your observations with interest and I am glad that you are idealistic enough to do repair work as it should be done.*

*In many such cases where so much butchery has been done to a clock, it might however be more prudent to refuse such work. This is because despite all your skilled efforts, that clock's ghost may come back again and again to haunt you, plaguing you for not letting the tortured timepiece rest in peace (or should it be "piece"?). Sometimes a good quality movement, new or bought at a clock collectors' mart, would be better if the quality of the case warrants a new life.*

*I have searched through my many records and books of trademarks and fail to come up with a symbol of a heart with the name in it. It would appear that such an obvious symbol would find many who would chance on such a simple trademark. If you could send me a good photo of the clock, its separate movement, and actually draw the markings on the dial, case or movement, I'll try to give an opinion as to its origin and age, but no appraisals.*

Henry B. Fried

I believe I can identify the ST clock and some questions submitted by Mr. George St. Garrity. This was in the December 1986 issue of *Horological Times*.

Although the photograph is not too clear, I feel pretty sure that the unit is from an IBM International Time Recorder Co. (Endicott, NY), Dial Recorder. In my early tenure with IBM (early 1950s and late 1940s) I repaired many of these. It was encased in a yellow oak case with glass access doors on the sides and a large (about 40") cast iron ring on the front. The dial was about 8" in diameter with a glass door and lock. The cast iron ring had 50-100 holes in its face, each numbered. A cross-head lever was rotated to a number, a tip pin pressed into the hole, and the workman's attendance was recorded on a paper strip, or ledger sheet, inside the case. These were called "dial attendance recorders." They were made in "daily dial" for one work shift and "daily double dial" for a two work shift day. The "payroll dial" used a ledger sheet which was good

for a week. The "daily dials" required a new time strip each day. Attendance time for normal hours was recorded in block print, over, or short-time in red.

The International Time Recorder units (called ITR) were later called IBM, ITR Division. This was the IBM that I worked for in the late 1940s.

In the photograph you can see a large hole (about 5/8" in diameter) in the lower frame central area. A "co-axial shaft" passed through that hole to rotate the document drum and to set off the printing works.

The pendulum rod (called a Lyre in the article) was so made to permit the crosshead lever shaft to pass to the "cast iron ring" axis on the front of the case. Later pendulums were not "lyre-shaped" but were as if one side of the Lyre is removed.

Later movements had only one window in the plates—the one around the escapement. The winding key was about 9" long with a cross handle about 6-7" long. The shaft squares were 0.280" across the flats. A 1" long shaft extended through the back plate from the center wheel and was connected to a u-joint and onward to the printing mechanism.

Movements (ITR, IBM, etc.) had a serial number just under the escape wheel shaft on the front plate (not true on older units). The beat rate (80) is on the upper left of the front plate.

There was a question on the mainspring. The springs are 3/4" wide and 0.035" thick. I believe the spring length was around 140". The movement is a dual-spring unit which provides maintaining power. The two springs powered the entire clock, except for the printing mechanism. With a spring of 0.035" thickness, the strength would be about eight times that in an American kitchen clock having a 3/4 x 0.017" spring (cube of the ratio in thickness). Many hands have been hurt badly from click failure.

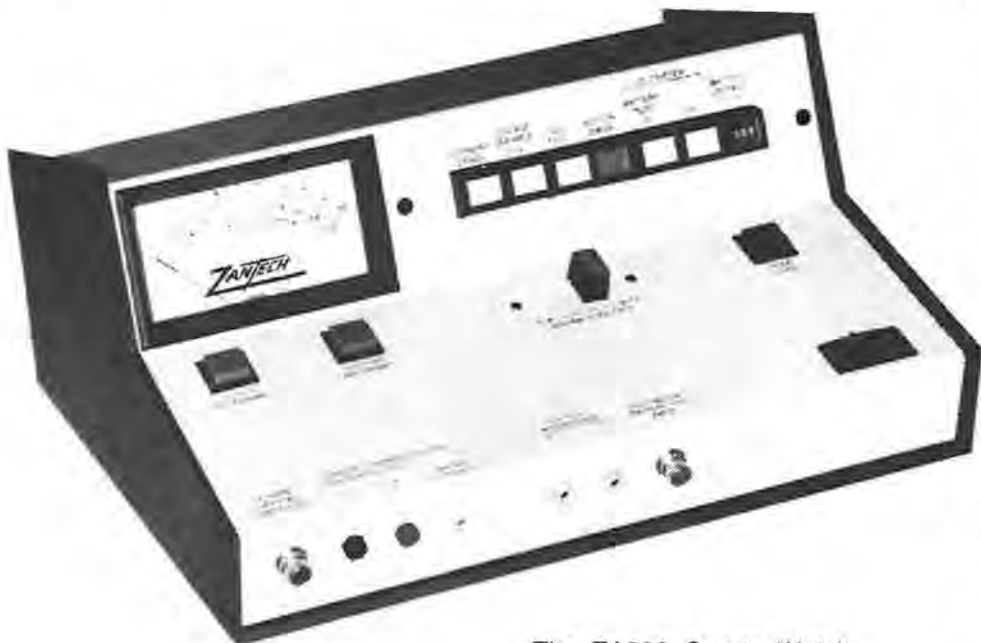
The W.L. Bundy Co. and the Dey Dial Recorder Co. are in the ancestry of today's IBM. I believe the specimen to be the Dey or ITR unit.

Your article brought many fond memories.

J.M. Huckabee  
Austin, TX

# Quartz Watch Analyzer:

## Model ZA900

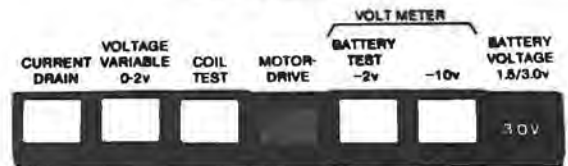


The ZA900 Quartz Watch Analyzer was designed by Zantech's engineering staff, in conjunction with their expert quartz watch technicians, to produce a test instrument that is user friendly. There are no complicated connections. The hook up-cable system and the test selection buttons are color-coded for easy operation. Zantech prides itself on making sure that every ZA900 owner knows how to use the instrument to its utmost potential.

In addition to the clearly written and illustrated instructions, an unlimited telephone hotline is available to answer all technical questions and help solve quartz watch repair problems. Video tape instructions are also available at no cost, upon request.

ZA900 . . . \$995.00

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During the month of April the following will be mailed first class to each active member who is eligible to vote: the ballot, a background sketch of each candidate, and the voting instructions. Ballots should be marked and returned in the official ballot return envelope to the certified public accountant who is responsible for counting the votes and certifying the outcome. **ALL BALLOTS**

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The future of AWI depends upon the quality of the people who serve on the Board of Directors, the officers, and the members of AWI committees. Please take the time to study the qualifications of each candidate carefully. Vote for those whom you think will insure the continued success of our organization.

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# Bench Tips

Joe Crooks



## DRYING WITH A SKILLET

These tips come from Roland Taylor of Bakersfield, CA.

**A** lot has been written in the *Horological Times* regarding drying watch cases. Enclosed is a photo of my dryer I put together 15 years ago. I use it daily and it is still going strong. I used a non-repairable electric dutch oven skillet (dutch oven skillet being deeper than a regular skillet with a high dome lid). I cut a slot above the handle and in the lid for a 300 watt hair dryer to fit into after being taped to the handle of the skillet. The hair dryer is then plugged into an old photo timer. When drying cases I set the timer for about 20 minutes and go off and forget it. When the time is up, it shuts itself off. It is also excellent for drying clock movements after cleaning. Five to six minutes drying time is sufficient.

Another very simple tool I made recently is for removing those stubborn screws in battery hatch covers when changing batteries in quartz watches. I ground the point of a large 6-inch blade screwdriver so it just fits into the slot. I ground the end with a slight curve to match the bottom of the slot. With the leverage you have, it hasn't failed yet on the first try. However, I do refrain from using it in front of customers as they might wonder why the attack on their watch with such a big tool!

*Thanks for the tips, Roland. That tape you used must be good stuff to last 15 years, 'cause there would be lots of heat where it's taped to the skillet and hair dryer. From the picture it looks like the silver backed tape that the heating and air conditioning people use with their installation on*



*air ducking.*

*You are smart not using your battery hatch tool in front of customers. With the surplus of lawyers we now have, you may end up in a malpractice suit. When I need to shorten the mesh bands, so common on ladies' watches now sold, I mark the amount to be removed with a felt pen and excuse myself from the customer. Then I go in the back of the store to do the job with the "band adjusting tool", which is a large bolt cutter I happen to have.*

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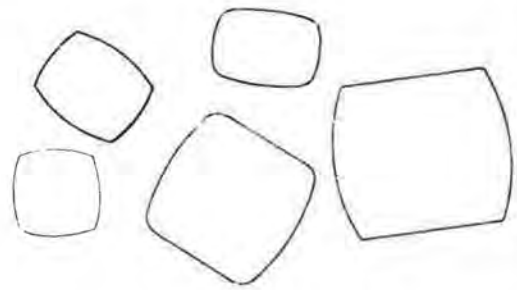
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## MODULE RETROFITTING

### PART II

In a past "Shop Talk" article (August 1983), we quoted Heidi Kemmerer of Seattle, WA. She explained that she spent many hours working with Kirk Dial Company of Seattle to obtain for them pillar plates of a number of quartz watches. They use these to help all watchmakers who send them dials to refinish.

Of that issue, Figure 1 shows dial interchangeables according to their dial feet arrangements—information which is still good. However, since that was about 3½ years ago, other lists are now available which are more complete (but too lengthy to reprint here). I'm sure there are several companies and wholesale suppliers who may have a list available. We've recently noticed one very good list (several pages long) which is available from the Cas-Ker Co., P.O. Box 2347, Cincinnati, Ohio 45201. Their "Quartz Movement Interchangeability List" shows the quartz caliber, dial feet position, movement thickness, and model number. It groups models having the identical dial feet positions and properly cautions that some dial feet may need to be shortened. Their list is quite complete with Swiss, French, and German. However, it doesn't seem to include movements from Japan.

Since we are going to use our customer's dial, we need a means to hold this dial on our new module (movement). If we're lucky, maybe we can find an interchangeability chart as explained above and find a new module that will fit (and if not, we need to cut the customer's dial feet off). Then we can either use some type of double face tape, preferably only the "dots" or "strip" types made for this use, or we can do a more proper job by refitting (soldering on) new dial feet to properly match our new replacement movement.

### ELECTRIC SOLDER MACHINE

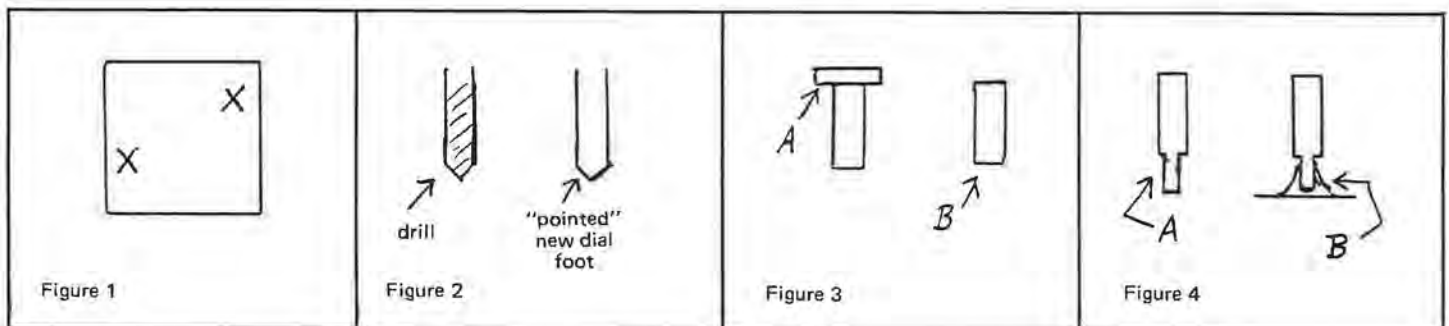
If we can carefully solder on new dial feet without affecting the finish on the dial we will save the time and money necessary to refinish the dial. Dial refinishing companies can be used if we do need a new dial look and if we get into trouble with our "dial soldering process."

Dial feet fitting is professionally explained and taught by several AWJ instructors. Two that come to mind are Buddy Carpenter and James Broughton—there may be others. These instructors have presented (with their courses) plans for a retrofitting dial electric soldering machine.

This machine works great—that is, with a little practice. We must take care lining up the new dial feet in exactly the correct spot. After talking to several watchmakers, I've found several methods used. One is to make an "X" at each of the two spots where the dial feet are to go (see Figure 1). The "X" should be large enough to "sight align" the dial foot.

Another method is to drill a very small hole at these spots. The hole must be short enough not to go through the dial. Then cut a point on the dial foot end to match the angle of the drill end (see Figure 2).

Although dial feet can be purchased, these are generally of the "pad" type (shown at A in Figure 3), and would be fine for the older watches which had a recess in the pillar plate for dial feet pad clearance. However, there is no room for this type in quartz watches. Therefore, just a round copper wire, Figure 3-B, should be used. Wires can be purchased from Radio Shack (or similar places) in various gauges. We have found that having gauge sizes 18, 20, and 22 will probably be all we need at this point in time. We may need to buy a small electrical





# SHOP TALK

wire roll of each size and then strip off the outside insulator. The smallest roll we can buy will be a lifetime supply. Be sure to get the solid wire type which has only one wire. Since this wire will come in a roll, we will need to straighten out a small length of this each time we use it, but this is easy to do. Some recommend undercutting the end of our new copper wire dial feet, as shown in Figure 4 at A, and then when soldered the solder will occupy enough surface after cleaning up to hold (see Figure 4-B).

To clean up (remove excess), a special tool that looks like a pin vise is used. The one we are familiar with is the Bergeon number 30511, called a "cutter for cleaning dial feet." There may be other tools available. This tool can also be used to reduce the diameter of our new copper dial feet, if necessary.

A lead type of soft solder recommended by suppliers should be used with matching flux. Each person must develop his or her own techniques, and lots of practice helps. I have made my own soldering machine, as have many others. But these soldering machines can be purchased at your wholesaler. A friend demonstrated one here at my shop and I was surprised at how well it worked.

**CAUTION:** We are not talking about a conventional "electrical soldering machine" as used for jewelry soldering. These would certainly burn off our dial finished, and we would really be "finished"!!

Another phase of retrofitting is fitting a new smaller movement into our customer's case. For a detailed explanation, I refer you to the "Shop Talk" article in the September 1983 issue of *Horological Times*. Generally, we can (and we should) find a replacement movement that will physically fit. But if not, the above reference is good material to review. I like the "ribbon epoxy" which can be purchased from local drug or hobby stores.

With our retrofitting, we may need to change the crown and maybe even the stem, and sometimes the hands. This can be a little work, but it is rewarding and a profitable new phase of our business. Our jobs should be neat enough so we are proud to put our AWI scratch mark (identification mark) in the case back.

Good retrofitting!

AWI

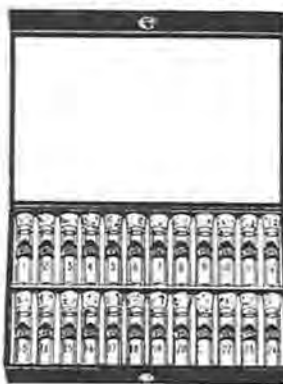
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# Chime and Strike

Steven G. Conover



## Smith's English Chime Movement

### PART II

In Part 1, I described a Smith's chime movement. This time we will cover the reassembly and adjustment procedure as promised. In addition, I'd like to take a close look at the chime correction mechanism. It's the most interesting part of the movement. I have numbered the illustrations and parts from the point we left off in February.

#### REASSEMBLY AND ADJUSTMENT

As chime movements go, this one is relatively easy to put together. The first step is to fit all the arbors between the plates. Be sure to include the strike hammer arbor at this time, because you cannot add it later without taking the whole movement apart again. This is because the rear of the hammer arbor is elongated to accommodate the strike hammer linkage.

The pillars for the hammer assembly must also be added at the beginning, for the same reason. The threaded portions make them too long to go in later. However, the rear bracket plate for the assembly, along with the pin barrel and hammers, can wait. One thing to note is that there is a brass spacer which must go onto the arbor which carries the hammers. It is easily misplaced during the cleaning process.

**Strike adjustments.** My usual procedure, once the plates are together, is to check out the strike first. In this movement, it is straightforward. Figure 1 (from February) shows how the rack hook rests in a slot in the gathering pallet. This is the locked position. The strike locking pin will rest against the strike locking lever, to stop the strike train. You must check to see whether the hammer tail has just cleared the hammer lifting star (not shown). This movement doesn't appear to allow any clearance at the rest position. As soon as the hammer tail drops off one of the points of the star, it falls to touch the next one. So your best adjustment is to set the train up so it will lock just after this drop occurs. To make an adjustment, make sure all mainspring power remains off. Separate the plates enough to permit you to disengage the hammer lifting wheel from the pinion on the gathering arbor. Experiment until you are satisfied.

The strike warning does not have to be set. The strike locking pin just moves the fixed distance from the locking to the warning lever, and that's all.

**Chime adjustments.** After adding the locking plate to the front of the movement, rotate the wheels until they lock. Install the locking plate so that one of the slots is directly under the pin on the long lever across the movement. As shown in Figure 3 from the February article, the locking action is between the plates on the chime locking cam. Set the warning action as indicated in the figure, to allow about a half revolution of the warning wheel. This places the chime warning pin at a one o'clock orientation when it is at rest. To adjust, you need to separate the plates and ease out the rear pivot of the warning arbor. Reset and check.

The chime drive wheel on the back of the movement carries a set screw. Loosen it and turn the wheel by hand to operate the chime hammers. After you have placed the hammers in sequence with the chimes, tighten the screw. The four chime hammers should move in order from front to rear as they sound the first quarter. I often leave this step for last, after all other adjustments.

#### CHIME CORRECTION MECHANISM

Figures 4 through 6 illustrate the main features of the automatic chime correction device. Look first at Figure 4. It shows the chime fourth arbor. As I mentioned in the February article, there are two cams on the arbor. The rear one is the chime locking cam (20). The chime locking lever (23) stops the chime train against the slot in this cam. In front of this cam is another one, the chime correction cam (24). It is almost identical in appearance. There is, however, a set screw for adjustment of the chime correction cam. Note the location of the chime correction arm (25).

First of all, the cam must be oriented the same way as the locking cam. That is, the sharp angle of the slot must be at the right as shown. It is possible to have the chime correction cam on backwards, facing the wrong way. If this happens, the automatic self-correction does not function.

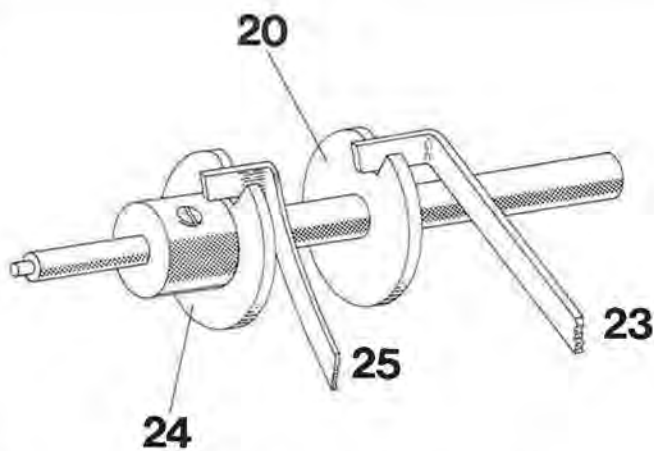


Figure 4. The chime fourth arbor carries two cams: one for chime locking, and the other for chime correction.

- 20 chime locking cam
- 23 chime locking lever
- 24 chime correction cam
- 25 chime correction arm

**How it works.** The basic idea behind the device is to place the chime correction cam in the way of the chime train before the hour chime. As you can see in Figure 4, it locks in the same way as the chime locking cam. The star cam (12, Figure 2) has only one arm long enough to raise the correction lever out of the cam slot to release the chime train. In operation, the chime train remains silent until the hour chime can play at the hour.

Figure 5 shows the mechanism in the "run" position. The device will not stop the chime train because the chime correction arm (25) is safely above the cam (24). To achieve this position, several parts are required. The chime correction arm rests on the chime correction arbor (27). The arbor runs between the movement plates. In front, it pivots in a wide slot. The tension spring (26) holds the arbor to the right side of the slot.

Figure 6 shows the "correction" position. At the end of the third quarter chime, a pin on the locking plate pushes down on the chime correction lever (8). The arrow in the drawing indicates the pin. This "sets" or cocks the mechanism by causing the lever to push the arbor (27) to the left, against the spring pressure. The chime correction arm drops off the arbor. (The arbor is notched, as indicated by the dotted line through its diameter.) As a result of all this, the chime correction arm drops down as shown in Figure 6. It can stop the gear train to prevent chiming.

Once the chiming does begin on the actual hour, the arm (25) moves up again. Aided by the coil spring, the arbor (27) slides under it to keep it clear of the cam (24). The mechanism is now back to the Figure 5 "run" position until it is "set" again.

**Adjustments.** The major adjustment is to the chime correction cam (24). If it is installed backwards, the sloping side of the slot cannot arrest the train. No matter how smoothly the mechanism operates, it will not accomplish anything. Install the cam as shown in Figure 4. It must be set back far enough to clear the chime warning wheel. If necessary, you

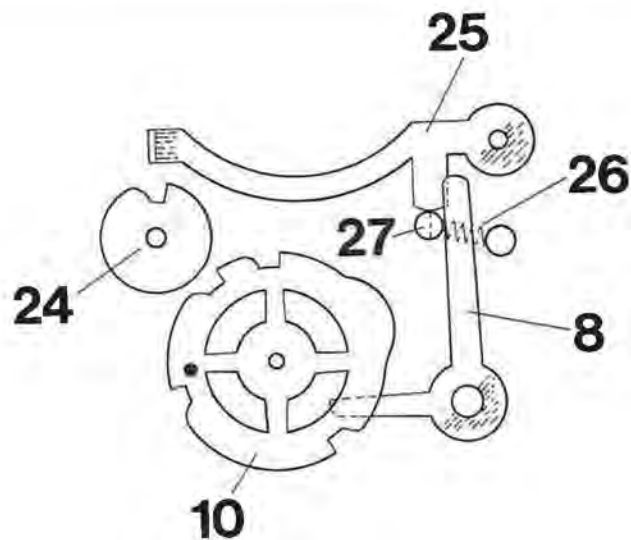


Figure 5. Chime correction mechanism, "run" position.

- 8 chime correction lever
- 10 locking plate
- 24 chime correction cam
- 25 chime correction arm
- 26 tension spring
- 27 chime correction arbor

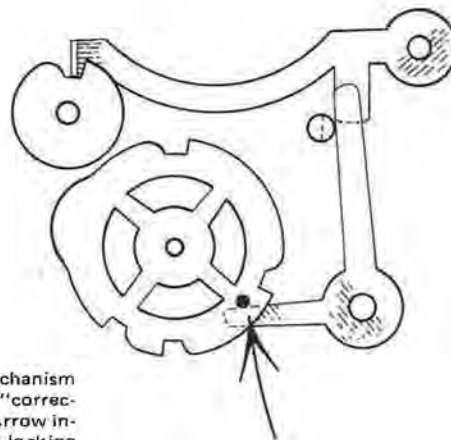


Figure 6. Mechanism locked for "correction" phase. Arrow indicates pin on locking plate, which "sets" the mechanism.

can also move the chime correction arm (25) further back on its arbor to give yourself more room; there is a set screw to permit the adjustment.

Next, you must rotate the chime correction cam (24) to the correct spot. The slots in the two cams (24 and 20) are not supposed to line up exactly with each other. The chime correction cam should be set a few degrees clockwise as shown in Figure 4. This allows the chime locking lever and cam to lock up the chime train routinely each quarter. The chime correction cam and arm provide a "secondary" lock before the hour only. If the long arm of the star cam is raising the lifting piece, the extra height will be more than enough to overcome this second locking action. If another arm is there, then it is not the hour. Although the chime locking lever and cam are released, the chime correction parts will still hold up the chime.

TIME

Fred Burckhardt



## *Do you know how to mosey?*

It's always a pleasure, at least most of the time, to visit groups in various locations around the country. Just about all of them will fall into categories which will denote the type of organization they are. For example, some are rather reserved and business like. Others like to let their hair down and have a little fun. Still there are others who overdo it a smidgen, yet still in good taste. Then there are those who are strictly non-couthful!

It pains me to have to bring a group like this to task. To save any embarrassment, the name of the state won't be mentioned. It does begin with a "W" and I'm not talking about Washington, West Virginia or Wyoming, and they do brew a lot of beer and make sausage and cheese. In fact, I still have indigestion from the sausage I ate so as not to hurt anybody's feelings when they insisted I try some. It isn't that they aren't such a swift group, but the worst part is none of them know how to mosey. Being from Texas, this cuts down the number of activities I could suggest. For instance, I couldn't say, "Let's mosey down to the bar and have a beer." "Let's mosey down to the restaurant and get something to eat." "How about if we mosey down to the meeting?" Any watchmaker with any couthfulness at all knows how to mosey!

Another thing about this particular assemblage, they do like to have fun. On Saturday night we all went over to the airport and watched as the women passed their purses through the x-ray machine. I wanted to visit a sausage factory but how much excitement can a person take in one night? The only thing that saved the whole evening was when Leilahni Rosenfeld demonstrated the mating call of a moose. Talk about your biggies, this was one of them.

I do have to admit, the motel was very up-to-date. They even had cloakrooms. Now let's face it, how many cloakrooms have you seen lately? Of course, up there it's important to have them because many still wear cloaks. This in itself isn't too bad but one character still wears a plaid jacket like my grandfather wore when he was in his teens. Another joker kept saying, "You look a lot taller than you do in your picture."

Even with all this, things weren't as bad as they sound. There was one episode I really hate to bring up, but I

feel it's my duty as a concerned citizen. We just wanted to test how honest these people were. A corner of a dollar bill was placed under a plate to look like someone had left it there. Only one, let me repeat, only one person tried to take it and put it in his pocket when he thought no one was looking. Even now it tears me up to think this person would do such a dastardly thing as trying to steal a dollar. It isn't important who it is. What is important is that it reflects on all of us who are in the same profession. How anyone who has reached the office of executive secretary of this state's association could stoop so low is beyond me. Thank goodness tonight is prayer meeting night. You can rest assured his name will be mentioned many times.

Regardless of what took place, all ended well. I was given a stick of sausage to bring home, which was rather a nice gesture. I hope they never find out I threw it in the trash can at the airport. As I walked away, the trash can burped.

What this outfit needs is some decent food. I usually don't do this but I'm going to share one of my favorite recipes. Please copy this down if you plan to have a large group over for dinner.

### MY FAVORITE RECIPE

- 1 Elephant
- 2 Rabbits (optional)
- Salt
- Pepper

Cut elephant into bite size pieces. This will take about two months, so plan ahead. Brown. Add enough gravy stock to cover meat. Cook uncovered at 465 degrees for about four weeks, adding enough liquid if necessary. This recipe serves about 3,800 people or 23 watchmakers. If more people are expected, add the two rabbits, but only if needed because most people don't like to find a hare in their stew.

If things weren't bad enough, when I got back to the store I was faced with changing a lithium battery in a plastic calculator watch. Word got out to the local watchmakers and they all gathered with their picnic lunches to watch me struggle with it. This in itself isn't too bad. What upsets me is when they start to take bets on how long it will take me.

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# CLOCKS *Inside & Out!*



Timothy R. White, CMC

## A Practical Guide to the Recoil Escapement

### Part 3

#### REPLACING A VERGE

It is beyond the scope of this article to go into the detailed considerations involved in creating, from scratch, a replacement verge for any given recoil escapement. It is necessary, however, for the repairman to have a procedure for installing and adjusting commercially available replacement verges.

There are many such replacement verges that are available through most supply houses. The most common are the "universal" replacement verges for American shelf clocks with strip pallet recoil escapements. Less commonly available (and used) are the solid replacement verges for both banjo and tall case clocks. The availability of such verges is a boon to the repairman who may lack the skill, time or profit margin to reproduce these verges from scratch. These replacement verges account for the majority of the verges that are replaced in clocks today.

Before the process of fitting a clock with a replacement verge can be fully explained, there is one additional term that needs to be defined. That term is span. Span is defined as the number of tooth spaces between the points where each pallet cuts the circumference of the escape wheel. Span is measured with both pallets cutting the circumference of the escape wheel to the same depth. The span must always be a whole number of teeth plus a half of tooth. In a square recoil escapement, this will be by definition, equal to the total number of escape wheel teeth divided by 4. In escapements where the center distance is more than 1.414 times the escape wheel diameter, the pallets will span more than one-fourth of the escape wheel teeth. In escapements where the center distance is less than 1.414 times the escape wheel diameter, the pallets will span less than one-fourth of the escape wheel teeth.<sup>1</sup> A practical value for span can be determined from the following procedure.

#### PROCEDURE FOR DETERMINING SPAN

- I. Count the number of teeth in the escape wheel.
- II. Use this number in the formula to determine the formula number (F) for that escapement.

$$F = \frac{\text{No. of escape wheel teeth}}{4}$$

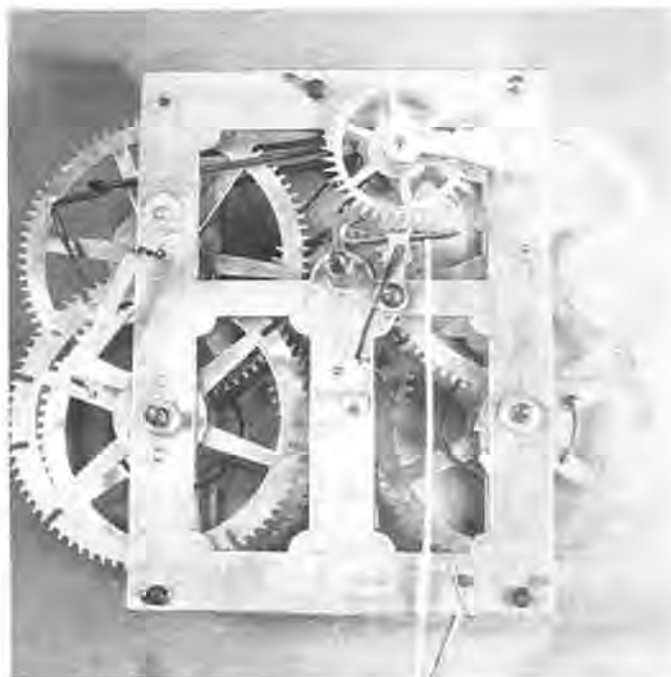


Figure 14. 30-hour Waterbury O.G. movement.

- III. Measure the center distance (CD) between the escape wheel and verge.
- IV. Measure the diameter (d) of the escape wheel. Multiply (d) times 1.414.
- V. If the result of step IV is equal to (CD), and the number of teeth in the escape wheel is part of the following set of numbers: 26, 30, 34, 38 . . . (n+4) then the escapement is a square recoil escapement and the pallets should span exactly one quarter of the circumference of the escape wheel. This will always be a whole number of teeth plus a half of tooth.<sup>1</sup>

<sup>1</sup>Aydlett, Guy D., "The Square Recoil Escapement". *Bulletin*, NAWCC Inc., Columbia, PA. April 1975. pp. 161-176.

VI. If (CD) is less than 1.414 times the escape wheel diameter, then use the following table to determine the span:

If the number of escape wheel teeth is:	*The span range is:
Less than 30	F - 1 or 2
30-34	F - 1 or 2
35-39	F - 1 or 2
40-44	F - 1 to 3
45-49	F - 1 to 3
50-54	F - 1 to 3
55-60	F - 1 to 4

If CD is greater than 1.414 times the escape wheel diameter, then use the following table to determine the span.

If the number of escape wheel teeth is:	*The span range is:
Less than 30	F + 1 or 2
30-34	F + 1 or 2
35-39	F + 1 or 2
40-44	F + 1 to 3
45-49	F + 1 to 3
50-54	F + 1 to 3
55-60	F + 1 to 4

\*The ranges given have an allowance of plus or minus ½ tooth to enable a final span that is a whole number of teeth plus ½ tooth.

The rule of thumb for determining the span is to select a tooth count from the tables given, based on the dimensions of the escapement. These tables indicate the range of tooth counts that could be spanned by the pallets while maintaining 45° angles of incidence and, therefore, equal lever arm ratios. The exact number of teeth spanned will vary with different center distances.

The formulas and tables outlined are based on the dimensions of an ideal recoil escapement. An ideal recoil escapement is designed with perfectly equal drops, equal lever arm ratios, and equal recoil on both pallets. It must be pointed out, however, that many recoil escapements, especially the strip pallet versions, were not designed with this in mind. When they were designed, the equality of some of these parameters was compromised to ease the manufacture, assembly, and adjustment. For the most part, these compromises do not seriously affect the running and time-keeping ability of these clocks as the quality of the rest of the movement is not extremely high. When it becomes necessary to replace a verge on one of these clocks, the procedure for selecting, fitting, and adjusting the new verge must take into account the fact that some compromises in the equality of the lever arm ratios and recoils may have to be made in order to bring the clock back to its original form. For this reason, in the guidelines that follow for fitting a new verge, an order of priority has been assigned to the establishment and adjustment of span, drop, lever arm ratios, and recoils. No procedure can be set for adjusting all recoil escapements that does not take into account the compromises that sometimes must be made. As a result, the procedure given for replacing recoil escapement verges will be less of a procedure than a set of

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Figure 15. Entry drop following initial adjustment.



Figure 19. Entry drop following second adjustment.



Figure 16. Exit drop following initial adjustment.

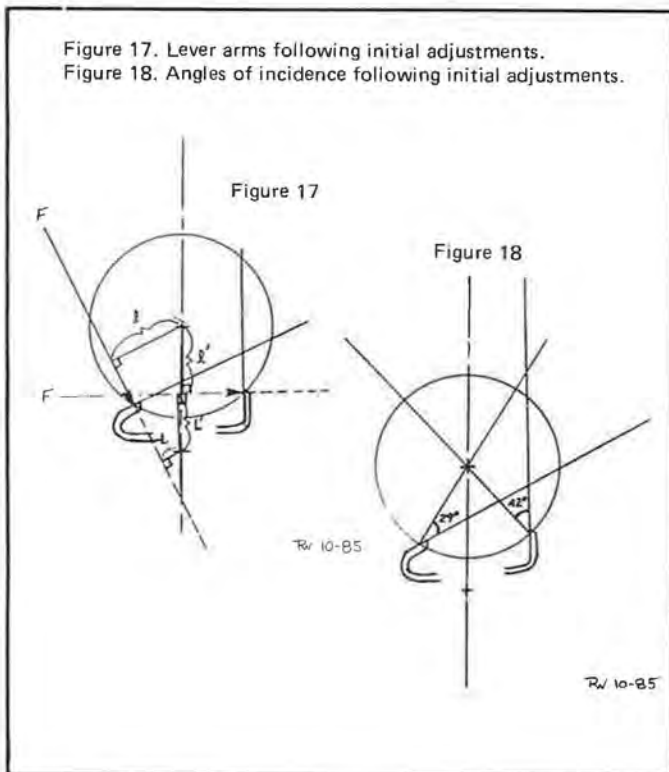


Figure 17. Lever arms following initial adjustments.  
Figure 18. Angles of incidence following initial adjustments.

guidelines. These guidelines are intended for use by individuals with a complete and thorough knowledge of the operation of this escapement. In order to make these guidelines clearer, they will be followed by an example of the process of replacing the strip pallet verge in an American shelf clock.

#### GUIDELINES FOR FITTING A REPLACEMENT VERGE

- I. Determine the span to be used.
  - A. Measure the escape wheel diameter and the current center distance. Determine the span range from the procedure for determining span.
  - B. Fit the replacement verge to the clock and determine the exact span, from the range given, that can most easily be achieved with that verge.
- II. Adjust the verge to the correct span. Adjust the inside drop, then the outside drop.
- III. Remove the verge and draw the lever arms and angles of incidence.
  - A. Measure and compare the lever arm ratios for equality.
  - B. Measure and compare the angles of incidence for equality.
- IV. Determine the adjustment(s) necessary to make the lever arm ratios and angles of incidence (recoils) equal. Make those adjustments that make both parameters more equal, then re-adjust the drops.
- V. Repeat steps III and IV until the lever arm ratios and angles of incidence are either equal or until the optimum compromise has been reached.
- VI. Harden and polish the pallets.

NOTE: For ease of adjustment it is best to anneal the entire verge before any adjustments are made.

The 30-hour Waterbury O.G. movement in Figure 14 was selected for a verge replacement example. This movement has an escape wheel tooth count of 42 and a diameter of 1.35" with an original center distance of 1.91". These specifications indicated that the #4900 universal verge from our supply house would be the correct replacement. Before the replacement arrived, some preliminary calculations were performed. With a tooth count of 42 and a center distance of almost exactly 1.414 times the diameter of the escape wheel, this escapement appeared to have been designed as a square recoil escapement. As a square recoil, the span would be  $10\frac{1}{2}$  teeth or exactly one-fourth of the circumference of the escape wheel with the angles of incidence equal to  $45^\circ$  and the lever





Figure 20. Exit drop following second adjustment.



Figure 21. Lack of clearance following second adjustment.

arm ratios equal. When the new verge arrived, it was installed and found to span only 7 teeth. Obviously further adjustments were going to be needed.

The first adjustment was to correct the span. The theoretical span of  $10\frac{1}{2}$  teeth was obviously not practical with this verge. It was apparent that the span would have to be less than  $10\frac{1}{2}$  teeth if this verge was to be used without major alterations. From the tables given it can be seen that a span of less than  $10\frac{1}{2}$  teeth would be possible if the center distance was made less than 1.414 times the escape wheel diameter. With a tooth count of 42, the span range (assuming a CD less than 1.414 times the escape wheel diameter) would be from  $7\frac{1}{2}$  to  $9\frac{1}{2}$  teeth. From this span range, a span of  $8\frac{1}{2}$  teeth was selected because it was the most practical value, requiring the least amount of work on the verge. This span also brings the verge closer to the ideal value. The entry pallet was cut back until both the span of  $8\frac{1}{2}$  teeth and a correct entry drop were obtained (Figure 15). The center distance was decreased to equalize the exit drop (Figure 16). At this point, the newly adjusted verge appeared to be fully operational and was in fact probably capable of keeping this clock ticking for many years. However, for optimum performance, the lever arm ratios and recoils had to be checked and made as equal as possible.

The center distance was measured and the outline of the pallets traced. The lever arms resulting from the initial adjustments can be seen in Figure 17. The angles of incidence resulting from the same adjustments can be seen in Figure 18. Figure 17 shows a clear inequality between the lever arm ratios with  $l'$  and  $L'$  nearly equal (ratio of 1.10) and  $l$  much larger than  $L$  (ratio of 3.60). Figure 18 shows an inequality between the angles of incidence with the entry angle of incidence smaller than the exit angle of incidence. To correct these inequalities it was decided to make the entry angle of incidence larger by bending the entry pallet down toward the belly of the verge. This would also have the effect of making the  $l/L$  ratio closer to the  $l'/L'$  ratio.

Following the second adjustment, the entry drop (Figure 19) is small, but acceptable. The exit drop (Figure 20) is now much too large. Figure 21 shows that a further decrease in the center distance to correct the exit drop would bring the escape wheel teeth into contact with the belly of the verge. To conclude this adjustment, the exit drop was set as close as possible to the entry drop. The center distance was

*(Please turn to page 38)*

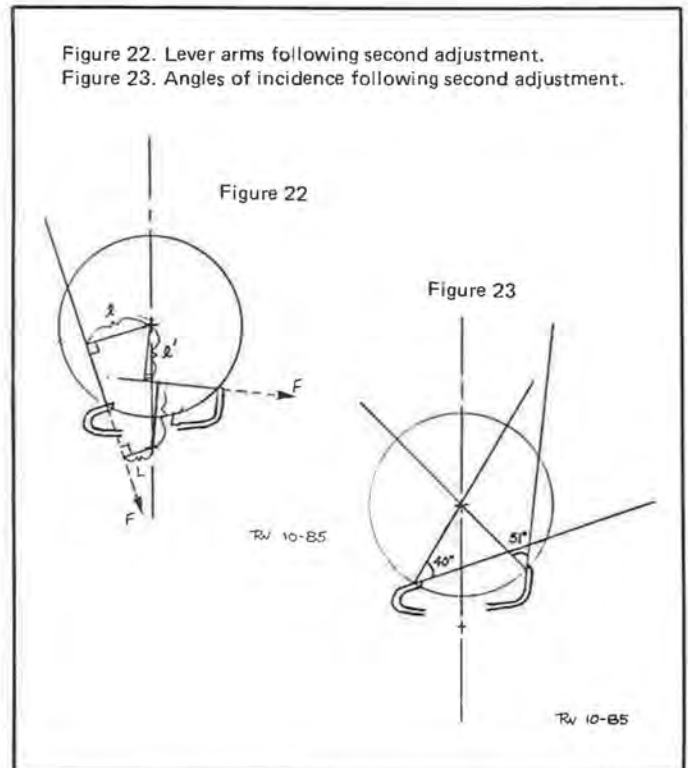


Figure 24. Entry drop and exit lock.



Archie B. Perkins, CMW, FNAWCC, CMBHI  
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## Part XVI

In continuing the discussion of making ratchet wheels for antique watches, it is next in order to discuss the cutters used to cut the teeth before the actual making of a ratchet wheel is discussed.

There are mainly three styles of cutters that can be used for cutting ratchet wheels. These are shown in Figure 1. View A shows the most common style used because they can be obtained ready-made from cutter manufacturers. These milling cutters come in different angles. Bergeon supplies a set of these cutters in the following angles: 20°, 25°, 30°, 35°, 40°, 50°, 60°, 70°, 80°, and 90°. Bergeon also furnishes a 25°+ cutter that has its teeth cut in the opposite direction so it can be used face to face with any of the other cutters in the set to obtain angles for which there is no single cutter in the set. For example, when the 25°+ cutter is used in combination with the 20° cutter, then a 45° angle is obtained. When the 25°+ cutter is used in combination with the following cutters in the set, angles can be obtained that no single cutter in the set will cut. These are the 20°, 30°, 40°, 50°, 60°, 70°, 80°, and 90° cutters. The 90° angle cutter in the set can be used in combination with the other cutters to obtain angles up to 170°.

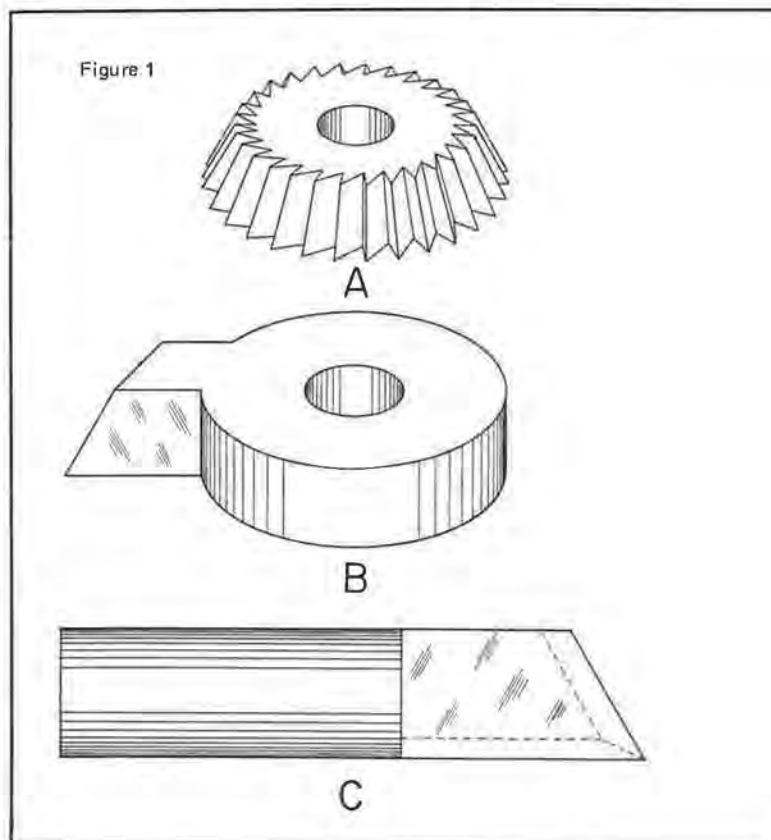
These cutters have fine teeth and cannot be re-sharpened except by regrinding the flat surface of the cutter leading up to the points of the teeth. The teeth are too fine for grinding them to sharpen the cutter as is done with cutters which have coarser teeth. These cutters can be used to cut brass or steel ratchet wheels.

Another style of cutter that can easily be made by the watchmaker is shown in View B, Figure 1. This is a circular fly cutter. Cutters of this style are made from high carbon steel drill rod, and they are excellent for cutting brass ratchet wheels. These cutters can also be used to cut steel ratchet wheels if they are correctly hardened and tempered and are turned at a slow speed. The cutter should be made as hard as possible in the hardening process and tempered only slightly (to a very pale straw color). The speed that the cutter is turned should be no more than 800 to 900 R.P.M., and the cutter should be fed through the material very slowly. An adequate amount of cutting oil should be kept on the wheel

blank during the cutting process. When cutting a steel ratchet wheel with a carbon steel fly cutter, it is also recommended that light cuts be taken. Cut one-third the depth of the teeth all around the blank, then lower the cutter one-third more, and so on until the full depth of the teeth is cut.

When cutting brass ratchet wheels with a fly cutter, the full depth of the teeth can be cut the first time around the blank. The cutter can also be turned much faster than for steel. When cutting brass ratchet wheels, the cutter can be turned at between 1500 to 2000 R.P.M., and the cutter can be fed through the blank faster than for steel ratchet wheels.

Figure 2 shows how a circular fly cutter is formed from a high carbon steel disc and how the cutter fits on an



arbor chuck. To make this cutter, the shape of the cutter is scribed on the steel disc. Then the center hole is drilled. The hole in the disc is then bored out to size. The disc is chucked by its edge in a wheel chuck or bezel chuck in the lathe, and a boring tool is used in the slide rest for boring the hole. Next, a jewelers saw is used to saw the cutter from the disc. After this, the cutter is filed to shape. The angle on the cutter can be formed to either side of the cutter tooth as long as the angle is proper to cut the desired shape tooth on the ratchet wheel. The cutter must be relieved on the back side of the tooth of the cutter to allow clearance for the cutting edge of the cutter to go through the wheel blank without dragging. The side of the cutter tooth leading up to its point should also be relieved. The amount of relief would depend on whether the cutter is used for cutting steel wheels or for brass wheels. Cutters for cutting steel wheels should have less relief so the cutter will hold up better; whereas cutters for brass can have more relief. Cutters for steel should have 10° to 12° relief and cutters for brass should have 15° to 20° relief.

After the cutter has been shaped, then it is hardened and tempered to a very pale straw color. Then the cutter is finally sharpened by grinding it on a fine India wheel in the lathe.

Another style of fly cutter that can be made by the watchmaker is shown in View C, Figure 1. This style of fly cutter is made from a piece of round high carbon steel drill rod.

The procedure used in making this cutter is shown in Figure 3. First, a step is filed to the center of the rod as is

shown in View A, Figure 3. The length of this step should be approximately 5.00 mm. Next, the angle and relief are filed on the end of the cutter as is shown in View B, Figure 3. At this point, the angle and relief need to be only approximate because the cutter will be shaped more accurately when it is sharpened after it has been hardened and tempered. View C, Figure 3 shows the side of the cutter after it has been relieved. Note: It will not be necessary to relieve the side of the cutter if the thickness of the end of the cutter is equal to one-half or less than one-half of the diameter of the rod from which the cutter is made. Also, if the side of the cutter needs to be relieved, it would be better to do this by grinding after the cutter has been hardened and tempered. View D, Figure 3 shows a fly cutter which has its end hollow ground for cutting a curved tooth ratchet wheel. This curved surface is gotten by grinding on the rounded corner of a fine India wheel in the lathe after the cutter has been hardened and tempered.

When hardening this style of fly cutter, the body should not be hardened (only the tip part of the cutter). This is so the set screw holding the cutter in the arbor chuck will bite into the body of the cutter holding it securely so it cannot shift during its use. After hardening these cutters, they should be tempered to a very pale straw color. Note: This style of fly cutter can also be made from high speed steel drill blanks which are already hardened, or they can be made

Figure 2

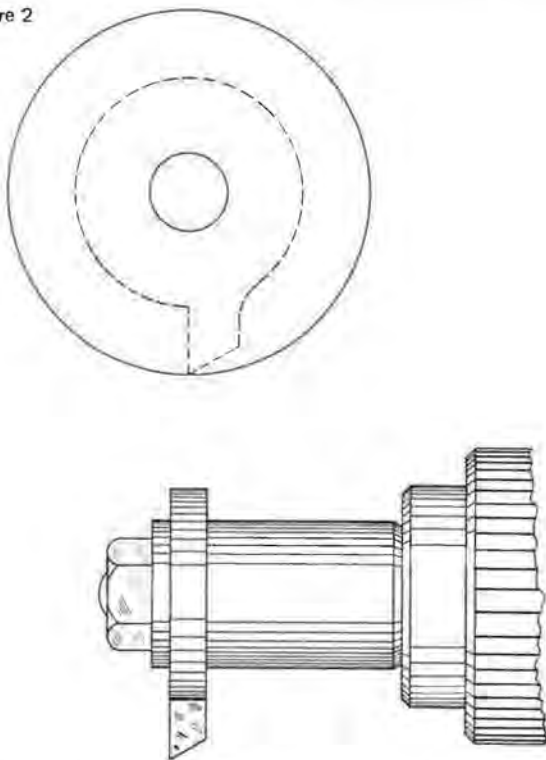
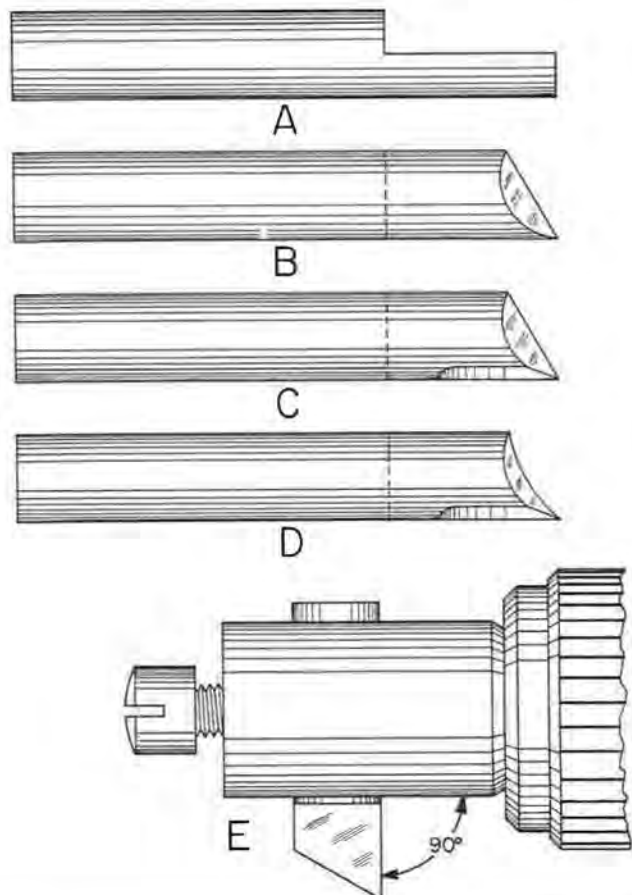


Figure 3



from carbide drill blanks. In these cases, they would need to be shaped by grinding. High speed steel and carbide hold up better than carbon steel when it is being used as a cutter for steel.

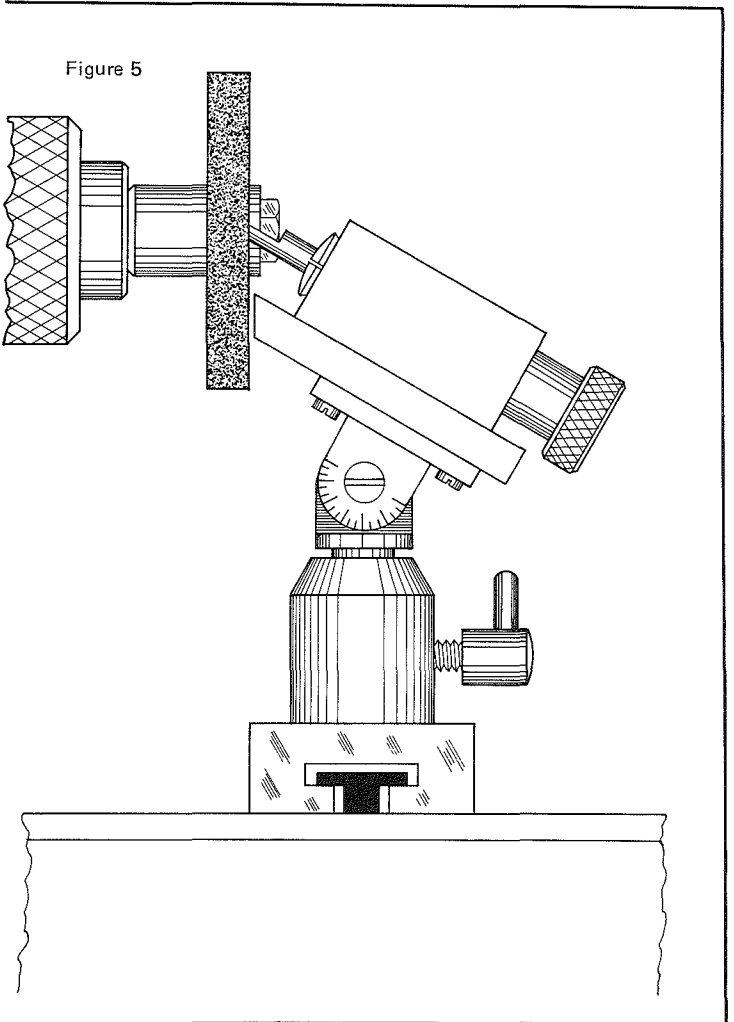
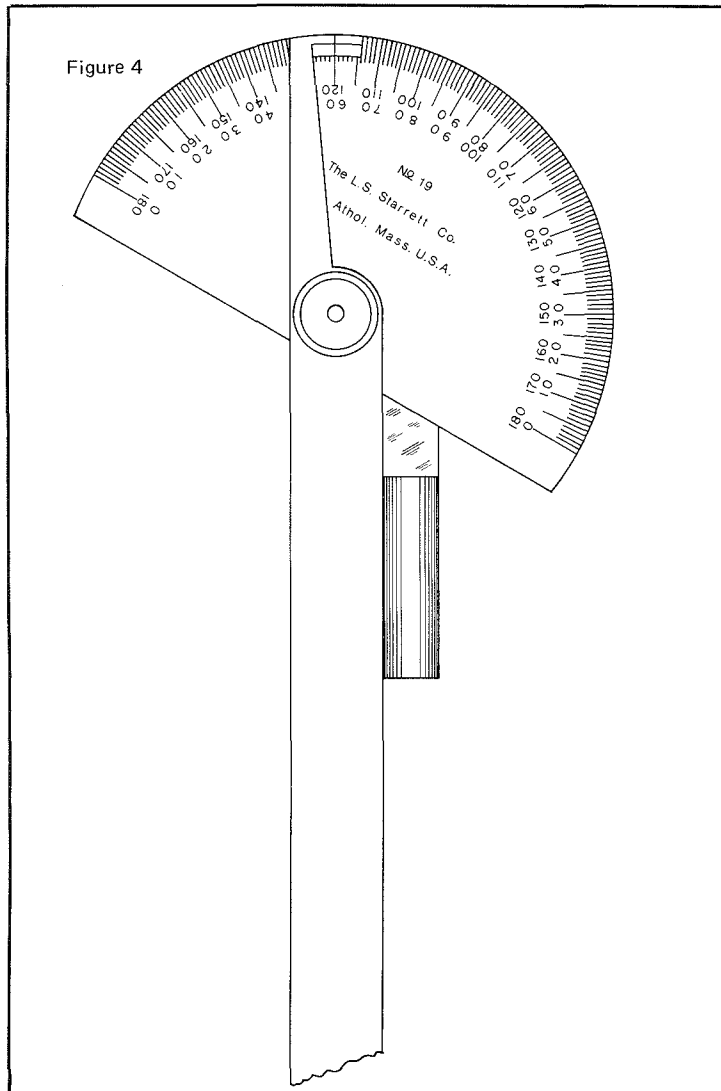
View E, Figure 3 shows how the finished cutter fits through a cross hole in an arbor chuck as it is being used. It is very important that the cross hole in the arbor chuck be drilled square with the body of the arbor chuck. When the cutter is in the arbor chuck, there should be an exact 90° angle between the edge of the cutter and the body of the arbor chuck as is shown in View E, Figure 3. Also, the cross hole should be drilled slightly off-center with the diameter of the arbor chuck. This will allow for some extra clearance (relief) for the cutting edge of the cutter. This extra relief is especially needed when using the arbor chuck for holding fly cutters that are used to cut train wheels and pinions. The cross hole in the arbor chuck should be drilled while the arbor chuck is resting in a "V" block on the drill press table. A center should be spotted for the drill to start into. It is a good idea to first drill a pilot hole through the arbor chuck with a drill which is approximately one-half the diameter of the drill used to drill the hole for the cutter. It is also a good idea to decide on a size of rod for the cutters so the same size will be used each time a cutter is made. This should be done before drilling the cross hole through the arbor chuck.

When making fly cutters for ratchet wheels, it is very important to be able to measure the different angles on the cutters. An excellent tool for this is shown in Figure 4. This is a steel protractor which is adjustable to any angle. This tool should be a part of every watch and clockmakers' tools. This protractor is also used for measuring angles on gravers and slide rest cutters as well as circular wheel cutters and in many other situations.

Figure 4 shows the protractor being used to measure the angle on a fly cutter. In this case, the angle of the cutter measures 60 degrees. That is, 30 degrees have been removed from the square end of the cutter which leaves the cutter with a 60 degree angle. When using the protractor, place the cutter or item flat against the edge of the blade of the protractor. Then move the dial of the protractor until the straight edge of the dial conforms to the angle on the item. Now the number of degrees can be read by noting which mark the indicator mark on the end of the blade lines up with on the dial.

Shaping and sharpening fly cutters can be done by the hand held method if the watchmaker has developed the necessary skill to do this. Otherwise, it can be done with the aid of a saw table and a square chuck holding device. A fine India wheel is used for grinding the cutters.

Ready-made saw tables on the market are of the stationary type that fit in the hand rest. There are two adjustments that can be made: (1) the hand rest can be moved on



the lathe bed, and (2) the saw table can be raised and lowered in the hand rest. Another desirable feature that a saw table should have is for it to be able to be tilted for grinding angles. Figure 5 shows a saw table that can be tilted to different angles. As far as is known, this type of saw table is not on the market, but it could be made up by a machinist. This illustration shows a fly cutter held in a chuck in the chuck holding device for grinding the relief angle on the fly cutter. The saw table has been set at a 30 degree angle. The table can also be set in such a position that a concaved surface can be round on

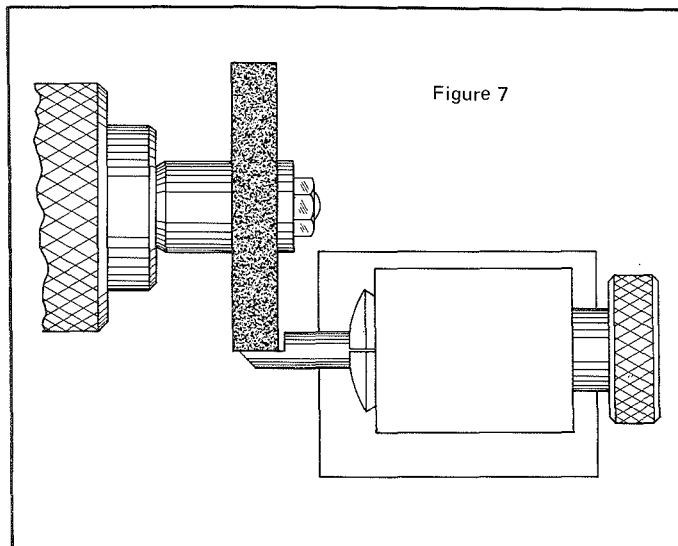
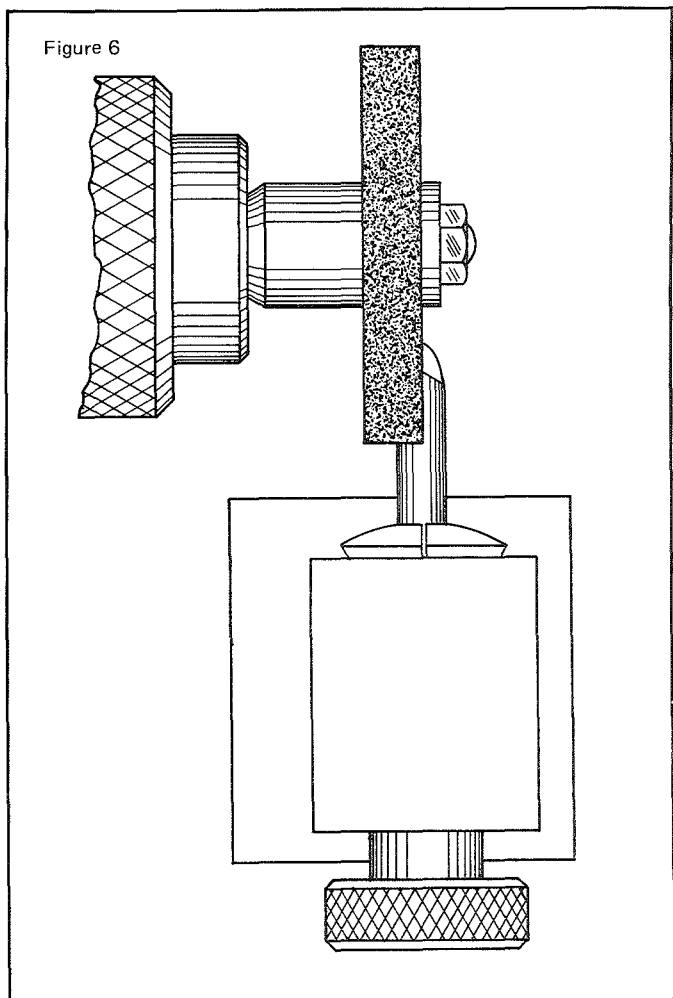
a fly cutter for cutting curved tooth ratchet wheels. The concaved surface would be gotten on the rounded corner of an India wheel.

If a tilting saw table is not available, then the same type of effect can be gotten with a regular saw table by raising the saw table so the grinding will be done above the center of the grinding wheel and by grinding on the edge of the wheel instead of its side.

Figure 6 shows how the saw table and chuck holding device are used to sharpen a fly cutter by grinding the flat face of the cutter. For this operation, the saw table should be in a level position and adjusted to a height so the cutter will be on center with the grinding wheel.

Another method for sharpening a fly cutter is shown in Figure 7. In this method, the face of the cutter is hollow ground on the edge of the grinding wheel. This method makes the cutter ultra sharp. When grinding on the edge of the wheel, the edge of the wheel should be flat and square. Also, the saw table should be adjusted in height so the grinding is done on center with the wheel.

Next month, the actual making of ratchet wheels will be discussed.



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# THE PICKLE BARREL



Marshall F. Richmond, CMW

## BASIC JEWELRY REPAIR

### MAKING AND REPAIRING SILVER JEWELRY LESSON 8

**A** simple rule which almost always applies to any kind of repairing is if you can make an article you should be able to repair it since you should be familiar with its construction. This rule applies to the repair of silver jewelry, for in making it you learn how to cut, file, solder, shape and finish, which are still the main ingredients of repairing.

One of the most popular types of silver jewelry is the Indian silver with turquoise or other stones set usually in bezel settings. As these stones are rarely cut in standard sizes, the settings have to be hand made to fit the stones. If a stone has to be replaced it must either be cut to fit the existing bezel or a new bezel made to fit the stone. Most jewelers will not take silver jewelry for repair because they have no experience in repairing it. The fact that silver is such a good conductor of heat makes many craftsmen shy away from it, so they never learn how to handle it. Silver requires much more heat to flow solder than on other jewelry metals even though silver solder probably melts at a lower temperature than other jewelry solders.

In this lesson I will explain step by step how to make a so-called Indian turquoise ring and how to size it, usually without removing the stone(s).

Tools needed are a hoke type torch (a mini or little torch will not furnish enough heat to work silver satisfactorily), jewelers saw, ring mandrel, bow pliers or bending device, asbestos (or non-asbestos) soldering pad, steel chasers hammer, rawhide mallet, half-round file, flat file, needle files, and burnishing tool.

Materials needed are silver stock of sterling, coin or Mexican silver: one piece 5 mm wide x 2 mm thick by 60 mm long; one piece 8/10 mm thick and large enough to cut an oval 18 mm x 22 mm; and a strip to make the bezel 5 mm wide x 1/2 mm thick x 62 mm long. You will also need batons flux, silver solder, and pickling solution. See Figure 1, views A, B, C and D.

#### MAKING A RING

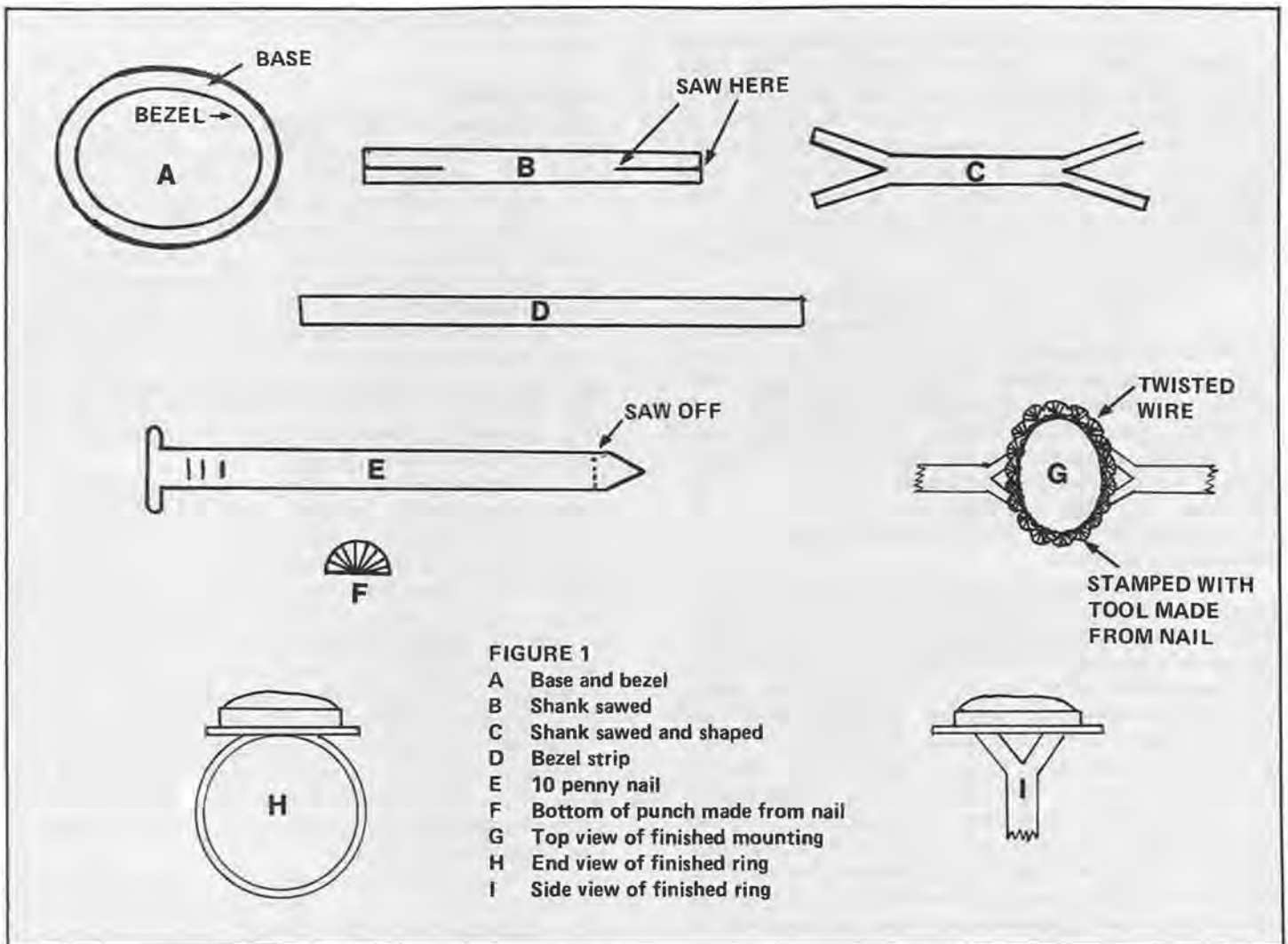
The ring we will construct, for sake of illustration, will be a size 8 and will be set with an 18 mm x 14 mm oval stone. Any oval stone of this size will do. The materials have been listed in the previous paragraph so we will start with the base.

Lay the stone on the 8/10 mm sheet and scribe around it; then trace a line 2 mm from the edge around the marked edge of the stone and cut it out with a jewelers saw.

This should give you an oval piece 22 mm x 18 mm x 8/10 mm thick. (See Figure 1, view A.) Bend the bezel strip which is 1/2 mm thick x 5 mm wide x 62 mm long until the ends just overlap, forming an oval and put it around the stone to see how much should be cut off and then mark it. Cut off and silver solder the ends together with a butt joint. Again fit around the edge of the stone. If the fit is too loose, a piece should be removed at the solder joint and then resoldered. If it is too tight it can be stretched on a ring mandrel or an expansion ring stretcher. The bezel should fit the stone so when lifted from the bench top the stone will fall out freely.

Align the bezel on the marked base which you have placed on the soldering bench pad. The line marked around the stone should be inside the bezel. With a flux brush flux around the inside of the bezel and place a small square of silver solder in the corner where the bezel meets the base opposite the place in the bezel where it is soldered together. Apply heat, playing the flame around the sides of the bezel where the square of solder is until the solder flows, making a spot solder joint. Quench it in pickle and rinse in water. Try the stone for fit and alignment and make any adjustments necessary so the stone will fall out when inverted. Place it on the soldering pad with the bezel up. Flux again inside the bezel in the corner where it joins the base. Then place about five more small squares of solder evenly spaced where fluxed. Again apply heat, working from the solder joint in both directions until the solder has flowed completely around and joined at the point where the bezel is soldered together. Quench in pickling solution and rinse it in water. Try the stone for fit and if it fits too tightly try spreading it with a burnishing tool working from the inside of the bezel until the stone fits.

At this point if additional ornamentation is desired a piece of 1/2 mm silver wire can be doubled making a loop. The two ends can be put in a pin vise and a screwdriver pin pusher or rod can be put through the loop. By rotating the pin vise, the wire can be twisted until a uniform decorative border can be formed. This can be shaped around the outside of the bezel, cut, silver soldered together at the ends, and placed around the bezel at the base. It can then be silver soldered by fluxing the wire and several small pieces of silver solder, placing them on the twisted wire. Do not use too much solder for it can ruin the twisted wire effect. Always move the flame of the torch about while bringing the temperature of the metal to the melt and flow of the solder. Too much heat applied in one place can result in melting the thin bezel edge.



**FIGURE 1**

- A** Base and bezel
- B** Shank sawed
- C** Shank sawed and shaped
- D** Bezel strip
- E** 10 penny nail
- F** Bottom of punch made from nail
- G** Top view of finished mounting
- H** End view of finished ring
- I** Side view of finished ring

After the solder has been pulled completely around the twisted wire, the next step is to prepare the shank and install it. The last piece of silver, 2 mm x 5 mm x 60 mm, will make the shank a size 8 when the ends meet. Split the ends about 12 mm from each end, and with a bench knife bend the ends out making a fork on each end. See Figure 1, views B and C. The shank can be bent in a rough circle using bow pliers and rounding on the mandrel. With the split ends together and the shape roughly rounded, the four points of the forks can be fluxed and fluxed solder placed on them on the outside of the circle. Heat until the solder flows and place it on the bench solder pad with the bezel down. Position the shank where the four ends of the shank are together center on the base. Flux and heat until all four points are soldered to the base. Quench in pickling solution and rinse in water. Put on the ring mandrel and with the rawhide mallet tap until the shank is round. If all measurements were correct the ring should be about a 7 or 7½. As we want it to be an 8 it can be stretched on the mandrel by tapping the shank opposite the base with the steel chasers hammer.

The next step is to file around the base edge so the distance from the bezel to the edge is uniform all around. File away any excess solder or uneven places in the shank, base or bezel. More decorating can be done to make the ring more ornate, for even with the twisted wire around the bezel this will be a very plain ring. Although there are many ways to add decorations to the ring a very easy and simple way is to file notches evenly spaced all around the base edge and then file the notches into small half rounds making scallops all

around the edge. A small half round punch can be made by filing the end of a ten penny nail or steel rod of equal diameter leaving the end half round. From what was the center of the end to the outside edge, lines can be made with a saw then filed with a triangular needle file as shown in Figure 1, views E and F. Since silver is soft, the punch need not be tempered for it will make good indentations without dulling. Align it in each scallop and tap the punch hard enough with a hammer to make a good indentation. The lip of the bezel can be put in the "V" of a bench block to back it up with something solid for tapping with the punch and hammer. Other methods of backing this up can easily be devised, such as using a piece of steel with a tapered end in a bench vice for holding. It can then be repolished before the stone is set.

The stone for this type of a setting must be a flat back stone. It can be a cabochon or a flat top stone but a cabochon works well in this type of setting. With the bezel the width it was made, the stone would set too deep and when burnished over the bezel, it would cover too much of the edge of the stone, so the stone seat can be filled partially with boxwood sawdust. This also forms a cushion so when the bezel is burnished over the stone it will not create a pressure that will fracture or chip the stone. With a burnishing tool burnish the bezel over the stone starting on each side, then each end, and then burnish it all around until it is tight over the edge of the stone. The ring should now be complete except for the final polishing. Polish with tripoli and rouge on the polishing motor to produce a bright finish. Scrub in a soap and ammonia solution or in an ultrasonic tank and dry under

a heat lamp or dryer.

This may sound like a very time consuming job, but it should take less than two hours. Several years ago I was invited to give a demonstration at a local high school art class and this was the project demonstrated. Having one hour in which to work, I made the ring components and assembled them except for setting the stone and polishing it. It took about another half hour to finish it in my shop. If you check the price these rings sell for and consider the cost of material used, you can see that a tidy profit can be turned for a couple hours of your time.

After making a ring, you should be able to repair any part of it that needs repairing. As the ring described here is much heavier than most any marketed today, it should never need repair from normal wear. Many of the thinner rings that are sold have problems with the shanks breaking, the bezels not holding the stone, and even the base breaking especially when multiple stones are involved. These can all be repaired, although the cost sometimes will exceed the value of the ring. Even when this is the case, if the price is quoted to the customer before the job is taken, many will approve it and the repair can be made.

Ring sizing on these rings is always in demand. Whenever a repair is to be made on or close to the base or bezel, the stone(s) should be removed. As silver is soft and workable this can be done easily by running the point of a short pointed knife around the stone between the bezel and the stone, burnishing the bezel away from the stone until it is loose enough to come out. Stones should be checked for cracks or flaws that might cause them to separate when removed. This should be done in the presence of the customer, noted on the repair ticket or job envelope, and explained that you cannot be held responsible. Most stones, even though they separate, can be reset after being cemented together with epoxy. When cured, epoxy can be polished and the final job will not look very different than before the stone was removed. Where small parts of a turquoise stone are missing, they can be replaced with chips of turquoise set in epoxy and then stoned smooth and polished with tripoli and rouge. This will change the appearance of the stone, but it will expedite the completion of the job. Replacing the stone would probably require having one specially cut since most of these stones are somewhat irregular in shape.

If the base is cracked or broken due to being too thin, it is easy to saw the shank off flush with the bottom of the base, file smooth, and cut a new piece to match the old base. Flux the new piece and arrange several chips of solder over the face of the surface. Heat until the solder flows, covering the complete face. Flux the side of the old base where the shank was sawed off and filed smooth, and align the new base on top of the old. Apply heat moving it until the metal becomes red and the solder melts letting the new base settle down on the old until you can see the solder flow all around the edge.

If the shank is heavy and in good condition it can now be reinstalled on the new base using the same procedure that was discussed in making the ring. The stone setting procedure, as well as polishing and finishing, is done in the same manner as when making the ring. Many bezels on silver rings are originally made too thin. Soon, through normal wear or from rough usage, they become damaged and will no longer hold the stone in place. These can be replaced by filing or sawing off the old and making a new bezel with the same procedure used in making and installing the bezel on a new ring. Always use a thick enough piece of metal for the replacement bezel so when you have finished it will be a permanent repair instead of thin and weak as the ring was before the

repair. Do this and you will soon build a reputation for doing quality work.

## SIZING RINGS

Sizing rings was not discussed in how to make a ring, so I believe I can give some helpful suggestions on how to size them, often without removing the stone(s). As on any repair first analyze it and mark the job envelope or ticket of any stone flaws, the size of the ring, and the size to be made. This information can be helpful if trouble is encountered on any repair or even for identification in getting a job back in the correct envelope. Some silver rings are rhodium plated, so to retain as much of the original finish the ring can be dipped in a solution of boric acid and alcohol and ignited. After burning out it will leave a white residue coating the entire ring. When heat is applied this coating will keep the finish from oxidizing and save much time and work when cleaning the finished repair and polishing.

Many silver rings are heavy enough to stand stretching from one half size to even several sizes. This can be done on an expansion stretcher or on a tapered ring mandrel with a rawhide mallet. Always closely inspect the ring under magnification after stretching every one quarter size for any sign of distortion. If it starts to distort, then the ring should be cut and a piece added, preferably with "V" joints just as you would in a gold ring. Since silver is such a conductor of heat it requires more heat to flow the solder quickly, I usually use a thicker and wider piece than the shank and make the ring at least a size smaller than it needs to be. After this piece is soldered in well it can be tapped on the steel mandrel with the steel chasers hammer to bring it to the right size. This will prove the strength of the solder joints as well as getting the ring to the exact size needed.

If this is a stone set ring, before applying heat wrap the stone setting with a wet paper towel and grasp it in the heavy duty tweezers which will hold the wet tissue in place. Heat and flux the joints, and while holding the stone up place fluxed silver solder chips over the cracks in the added piece which will be on the inside of the ring. If the silver ring is very heavy it will require a great amount of heat to flow the solder quick enough so that the paper will not dry out and let the heat get to the stone. A little or mini torch may not produce enough heat so I usually use the hoke torch. If this will not produce enough heat I have an industrial cutting and welding torch that will. Apply the heat from the underside of the ring shank until the solder flows completely through the joint. If the tissue dries out and starts to scorch and you can smell it, remove the heat and use a larger tip or torch after wetting the tissue again. This usually requires it to be fluxed again. If you do not have enough heat to flow the solder with the stone shielded, then removed the stone and make the solder flow.

In making silver rings smaller I would recommend always using a "V" joint; in fact for any solder joints in silver this type of joint is much stronger and more durable. Finishing after sizing is simply following the procedures previously described.

Charges for silver repairs should be consistent with the time and materials involved. Sometimes these charges will greatly exceed what the silver jewelry cost new. But if the price is agreed on when the job is left for repair there should be no argument over price when the piece is delivered.

The next article will be Lesson 9 and will deal with changing heads, bezels, tops and replacing shanks.



# Novice Watchmaker



James Adams, CMW

## TOOLS FOR THE NEW WATCHMAKER

**"A** craftsman is known by the tools he keeps." I don't know if I coined that phrase or picked it up eons back, but it's true. A craftsman is known by the tools he keeps.

Being fresh out of horological school or an apprenticeship program, you may already have your hand tools—a set of screwdrivers and a couple of tweezers maybe. Many employers of watchmakers require them to furnish their own equipment, other than cleaning machines and timing machines.

Maybe you're doing work out of your kitchen as I did at the start of my career. Learn to be a professional. Acquire professional equipment. Well-made professional equipment will serve you faithfully throughout your career.

Start to build a library of technical books and technical guide manuals. Watch factories, the Swiss Information Center, and best of all, AWI Central's extensive collection of technical guides are at your disposal. AWI automatically receives the latest information first as it becomes available outside the factories. AWI will receive information that is generally not available to us out here in the trade. No one knows it all or can retain the flood of technical information available. Books and technical guides are most certainly tools.

I find 3C tweezers very good for

general work. Get at least two of these in carbon steel and a couple in non-magnetic alloy (Dumoxel®). Keep those for exclusive use on electronic watches. I've also got three or four 3C carbon steel tweezers put away and use them *only* on balance spring (hairspring to you) adjusting. Also secure a "D" style cutting tweezers and I'll tell you the "H" style tweezers I secured in school was a blessing to me and my work.

Get a couple of pin vises. It's impossible to function without them. A couple of glass bell covers and movement trays are also necessary. I must have 24 of the movement trays. Generally half of them are in constant use holding jobs for material or estimate approval or uncased prolong timing.

You should acquire a watchmaker's lathe and chucks. I know it's a very expensive piece of equipment but this tool will prove its value all through your career. You'd be surprised at its versatile use. A good set of mainspring winders and a poising tool are necessary.

It would be in your best interest to learn to service and repair the older American pocket watch. Many schools don't really teach that aspect of horology. As time passes there will be a need for a highly trained watchmaker who can do this type of work. Servicing American pocket watches is an art in itself. As

time progresses we will cover various aspects of that art.

Many times I've heard watchmakers speak of making tools and test equipment that in fact can be had in the marketplace, built by toolmakers and test equipment makers to high standards at reasonable cost. Unless a tool is not to be had in the marketplace, it strikes me as foolish to devote time to make them when the same time could be used in the servicing of timepieces or furthering your knowledge of your craft. Toolmaking is an essential part of horology but you shouldn't spend your valuable time and talent "making things" that are easily acquired elsewhere.

Files and Arkansas slips are things you'll use two or three times a week. Get the best grades available, even though it may seem expensive; in the long run it's not. My Arkansas slips are probably 20 years old (and I might add, still going strong)! I've probably ran through four or five sets of the "store-bought" kind. I didn't make them in my time. They were expensive, but yet, after it was over and done with, they were very inexpensive.

When we meet next month, we'll discuss that "bug-a-boo": after repair stoppers. I'd like to say it never happened to me, *but* . . .



# WATCHES *Inside & Out!*



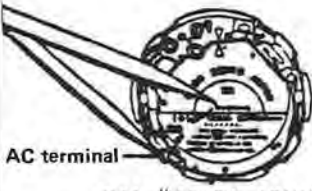
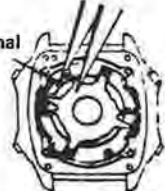
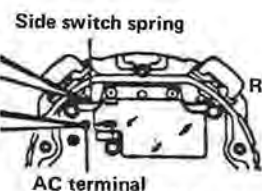
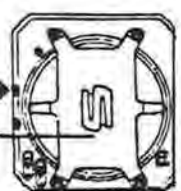

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## TECHNICAL NEWS DIGITAL WATCH SERVICE TIP

Due to the ICs design on certain digital watches, it is necessary to manually stabilize the digital display. Since each IC requires its own particular method of stabilization, refer to the following information to reset the display after changing the battery and/or checking the battery voltage.

### HOW TO RESET THE CIRCUITS:

#### SEIKO

CALIBER	METHOD OF RESET
A239A A827A A828A D409A M421A S101A S111A S234A	PUSH ALL BUTTONS AT THE SAME TIME 2 - 3 SECONDS
A708A A718A A826A S321A UW01A	RESET THE CIRCUITS BY SHORTING AC TERMINAL WITH BATTERY (+) <div style="display: flex; justify-content: space-around; align-items: flex-end; margin-top: 10px;"> <div style="text-align: center;">  <p>AC terminal CAL #A708A, A718A</p> </div> <div style="text-align: center;">  <p>AC terminal CAL #A826A</p> </div> <div style="text-align: center;">  <p>Side switch spring AC terminal CAL #S321A</p> </div> <div style="text-align: center;">  <p>Reset terminal Battery clamp CAL #UW01A</p> </div> </div> <p>*If necessary, refer to individual caliber reference guide.</p>
B337A	PUSH THE AC "ALL CLEAR" POINT <p>*The step regulation will return to "0". Be sure to recheck time accuracy afterwards.</p> <div style="text-align: right; margin-top: 10px;">  <p>Push here from above CAL #B337A</p> </div>

## SERVICING TIP

In order to test and adjust the correct timing accuracy on certain digital watches, it is necessary for the following list of calibers to use the pattern segment checking system (32HZ). This is due to the circuits' multiplex driving system.

### SEIKO

CALIBER	HOW TO ENGAGE ALL SEGMENTS FOR ACCURACY TESTING	REMARKS:
A354 A359 A547 A557 A714 A927 A939 C515 D138 *H127 G757	<ol style="list-style-type: none"> <li>1) Set the mode button to time and calendar setting function.</li> <li>2) DEPRESS buttons B &amp; C at the same time, for about 3 - 4 seconds.</li> </ol> <p>*Applies to DIGITAL only - For ANALOG testing refer to Analog test.</p>	<p>Microphone Device with Field Effect System.</p> <p>Measuring Time Gate 10 Seconds</p>
A829 F051 L423	<ol style="list-style-type: none"> <li>1) Set the mode button to the Time Display Mode.</li> <li>2) DEPRESS button A – hold for 3 - 4 seconds.</li> </ol>	
A229 A257 A258 A259 L221	<ol style="list-style-type: none"> <li>1) Set the mode button to the Time Display Mode.</li> <li>2) DEPRESS BUTTON B – hold for 3 - 4 seconds.</li> </ol>	
A638 A639	<ol style="list-style-type: none"> <li>1) Set the mode button to the Stop Watch and reset to 000000.</li> </ol>	
B122	<ol style="list-style-type: none"> <li>1) With crown pushed in to normal position, quickly turn it clockwise and then turn it counterclockwise – pull out the crown (within 2 seconds).</li> </ol>	
All Ana-Digi except Cal-H127	All Analog-Digital watches for testing, refer to all Analog System only.	Microphone Device Magnetic (Inductive) only

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# Book Review

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*HOROLOGICAL DIALOGUES*, Journal of the American Section, Antiquarian Horological Society (England). 7½ x 9", soft covers, 91 pages, 68 illustrations. Published 1986 by the American Section of the British Antiquarian Horological Society @ \$9.50 from Robert Stenard, 111 15th Street D2, Garden City, NY 11530.

This is the catalogue of the exhibition of spring-driven table clocks of the 17th century, held between June 10 and 14, 1986 at the Sotheby galleries in New York City to commemorate the 10th year of the American Section's existence. Although this issue is described as a catalogue, it is much more than that. To commemorate this event, the rarest and finest clocks of the 17th century designed for the table and having pendulums were assembled from all over the United States and Europe. This elaborate catalogue contains a complete record of the lecture given at the exhibit and all the clocks which were exhibited.

The catalogue carefully documents each clock with photographs of the clock and a complete description and comments about the maker, style and period technology. Movements of most clocks are shown as well.

The publication has an eight-page illustrated discourse by George C. Kenny II, president of the American Section of the British Antiquarian Horological Society on "The Development of the Spring-Driven Pendulum Clock - A Triumph of Mathematics and Science". Mr. Kenney's discourse traces, with illustrations, the development of the pendulum from pre-Huygens times, through the experiments of Galileo to the end of the 17th century.

Following this is a two-page reprint of the 1673 review of Huygens' *Horologium Oscillatorium* from Philosophical Transactions of the Royal Society of London.

Some of these early pendulum clocks in the exhibition which are pictured are two small hanging clocks by Solomon Coster of the Hague, who made the first pendulum clocks at Huygens' direction. One of these has an alarm attachment. Both have the cycloidal cheeks designed by Huygens and are dated about 1657-1658.

These first generation clocks by Coster are the simple small ebony-veneered, box-like cases with hour and minute hands, silvered chapter rings, rectangular brass movements with cycloidal cheeks at the pendulum suspension, verge escapement, and short bob pendulums.

Others shown at the exhibit and in the catalogue are also Dutch, one by Jacobus Nauta of Leeuwarden, c-1675, ornamented with tortoise shell veneer case and broken arch top. The movement provides quarter striking with alarm and date shown through a small square aperture in the dial.

A later 17th century bracket clock by Richard Bockett of London, c-1690, is ornately decorated with tortoise shell veneer. The movement has the short pendulum and the dial is finely matted in a square conforming case style with wheat-ear engraving, cherub spandrels and silvered chapter ring. A false pendulum swings through a curved aperture in the dial behind which is the maker's signature. Striking supplies

quarter hours with a pull repeat arrangement. The entire back plate is richly engraved with filigreed pendulum cock.

There are 17th century clocks by Edward East, Joseph and John Knibb, Markwick, two clocks by Daniel Quare, and one attributed to both Quare and Tompion with repeat on seven bells with rack striking. Like the others, all are illustrated with some showing their movements as well. Thomas Tompion too is represented by two unusual clocks.

Other makers' clocks are those by Henry Jones, William Knutterford, John Snow, Francis Streeley, as well as very early simple one-handed clock with pendulum by John Wise with an even more sparse and simple movement.

At "Tete'-de-Poupee" clock (head of a puppet doll) by Pierre Duchesne of 1675 has a 30-day rectangular brass movement with Huygens cycloidal suspension control, hour striking. The oval dial is finely engraved with silvered chapter ring and with quarter hour markings to the chapter ring as well. The red tortoise shell case has fine brass and pewter Boulle inlay work with ormolu mounts and matching bracket below. The ornate case is attributed to Andre-Charles Boulle, an unusually shaped case and highly ornamented example of Boulle work.

Another clock by Duchesne is more on the earlier Dutch style with a figure of the winged and scythed Chronos holding up the silvered chapter ring. A Parisian "Religieuse" clock by Antoine Guadron of 1695 is a 14-day duration, cycloidal cheeks to the pendulum suspension with velvet covered dial plate, and white porcelain cartouches for each dial figure. Other Parisian makers whose early pendulum table clocks were shown are those by Nicholas Hanet, S. Ladoucer (1660), Samuel Panier (1660), and Claude Raillard (1680) which has a verge escapement and a reconstructed balance and spiral spring movement in a modified teardrop case.

Italy is also represented by a 1680 period clock of simple lines made by Giuseppe Matino of Milan with a single barrel and mainspring for both the time and striking on a countwheel arrangement. Another Italian clock of the 1665 period by Marcho Santucci of Naples is also shown. This is a very rare night clock with a "wandering hour" disc moving across a circular arched aperture in the dial. The movement has a short brass pendulum verge escapement. A large barrel carries the movement with the back part of the barrel serving as the housing for the train of wheels. The metal plate of this barrel sturdily serves this purpose. The dial plate has a very fine period religious painting of Madonna and Child. A candle being lit behind the clock shone the night hours through the pierced dial numerals. This 40 x 26 inch ebony-cased clock is attractive and rare as many such clocks were destroyed by the candles with which they were illuminated. This is one of the more rare and attractive survivors.

A Bohemian bracket clock (1700) by Frantz Thomas Guntzschy of Prague with rack and repeat striking and fruitwood case, basket top and with metal frets follows the early English style of that period.

The exhibition at Sotheby in New York drew large audiences and the clocks and displays were quite attrac-

tive as attended and viewed by this reviewer. There is little doubt that such a collection of these rare clocks will ever be repeated.

The illustrated lecture is also included in this catalogue and its editing by Bruce Chandler with assistance of Clare Vincent of the Metropolitan Museum of Art make this catalogue not only a collector's piece itself, but an excellent visual and descriptive record of this important event.

*WRIST WATCHES, HISTORY OF A CENTURY'S DEVELOPMENT*, by Kahlert, Muhe and Brunner (with separate price reference guide). 10½" x 12", hard covers and dust jacket, 397 pages, 1700 b/w and color photographs and illustrations. Published 1986 by Shiffer Pub. Co. at \$50.00.

Originally published in the German language in 1983, this new, much enlarged edition is entirely in English. In the three intervening years, the collecting of vintage wrist watches and some not-so-old ones has rocketed in popularity.

Watches worn on the wrist are authenticated as early as 1806; ring watches were worn much earlier. However, as a mass-produced timepiece, the German navy of the 1880s ordered a number of watches to be worn on the wrist from the Swiss firm of Girard Perregaux. These had chain wristbands and are marked as a milestone in both production and aided acceptance by male civilians.

This book has chapters on the origin of wrist watches, comparisons between the wrist and the pocket timepiece, technological changes up to 1960, the classic wrist watch and the self-winding watch, all with the many subdivisions. Special types of wrist watches have their own chapters and subchapters such as alarms, watertight cases, chronographs, and other technical complications. Cases, products of various countries such as Germany, England, France and of course, Switzerland, are covered very deeply in movement photos, complete watches, and some drawings. Watches of the United States, England and Russia are tokenly represented and one wished that the American production, which was not inconsiderable, would have had a better representation. American wrist watches by Hamilton, Waltham, Elgin, Illinois and Rockford and Hampden would have enriched this volume even more.

Early quartz watches are shown and described in other chapters. Tips and aids in collecting wrist watches are included in another chapter. The authors (German) have included a comprehensive section on that country's wrist watch production up the last two decades. This edition contains almost 100 more pages than the earlier edition and is also larger in size. In these latter pages of this edition are the International Watch Company's "eternal" perpetual calendar, the DaVinci model, Omega's moon phase, eternal calendar (good far into next few centuries) and self-winding with a gold rotor. Similar items by Patek Philippe and others are shown as well. Tourbillon wrist watches with self-winding arrangements by Audemars Piguet join the others above,

made within the last two years and pictured here. Some of these wrist watches also ring time to the minute upon command. These are the recent products of Blancpain and Gubelin.

Wrist watches by the house of Breguet recently re-situated in Brassus, Switzerland from Paris for manufacturing purposes have produced items the quality of their founder Abraham Louis (1747-1823). Similar products by Genta made in 1986 are certainly collectors items even if made yesterday.

Why is this renaissance possible? The advent of the quartz watch and the competition from the Far East has caused the artisan formerly employed by the Swiss to become technological dodos. However, there are those in Switzerland who correctly surmised that this treasure in skills could be used to produce horological works, tours de force, and that there would be a market for these—and evidently there is.

This book pictures hundreds of complete watches in over 500 group photographs, each group large enough so that each movement pictured is easily recognizable. Particular maker's products, color groups of enamel cases, movements alone, advertising replicas, photos of important inventions, as well as some personages in the field of horological wrist watch technology are included.

There are pages of factory catalogue pictures of movements, some quite rare and interesting. These include the "polyplan" of Movado with actually curved plates and illustrations, showing how the wheels and plates were aligned to achieve the curved effect. Shock devices are shown in encyclopedic coverage.

Technical and manufacturing processes are explained in the text and in illustrations. Chronographs, calendar and self-winding systems of all types and eras are covered textually and pictorially. The various escapements found in wrist watches are found here, too. Dial types, styles, hand designs, and a good history go back to the early nineteenth century with examples make good viewing and reading. The Harwood self-winding watch and its development are covered.

The Accutron invention fails to include the contributions of the American engineering staff at Bulova in New York which made it possible to keep the tuning fork in motion. The Beta quartz also is covered.

Lists of makers, trademarks, and off-shaped movements are contained in other sections. Navigational watches used by famed aviators also are shown. Others include Masonic watches, Braille, the baton movement with the entire train and escapement in one line, and some comic watches. Included with each book is a special supplement and price guide of items in the book with comments on arriving at values.

This book is an important addition to the field of horological history and collecting as well. The price of \$50.00 for these five pounds is a bargain.

Henry B. Fried





...from all around the ASSOCIATION...

#### PENNSYLVANIA

Twelve members of the Allegheny Guild of the Watchmakers Association of Pennsylvania, Inc. met at Bob Bishop's shop on January 15 for the purpose of manufacturing dial foot soldering machines.

This guild project was based on the design of Jim Broughton, as modified by Bob Bishop. An assembly line type of production was used, and 16 units were completed in one evening. All of those participating had attended Jim Broughton's workshop on retrofitting in November. All profits from the production went to the guild.

#### NEW YORK

At a recent meeting of the Horological Society of New York a chalk-talk on the making of case bezels was given by Howard Fass. Since hand case making is practically a lost art, his discussion was received with unusual interest.

Mr. Fass confined his talk solely to the making of bezels. He exhibited the tools required and explained their uses. He then described the step-by-step procedure in bezel making. His talk included service hints that could be applied to pocket watch bezel repairs.

#### MICHIGAN

The Michigan Watchmakers Guild recently held a Quartz Watch Seminar given by Robert Bishop, AWI Instructor. Mr. Bishop had many good ideas and methods of testing and repairing quartz watches. He gave seminar members a step-by-step booklet on various troubleshooting tests and instructions on meter reading and plans for constructing a variable voltage supply unit. The variable voltage supply unit is used to power the watch movements while doing various meter tests on quartz watch movements. In turn, the watchmakers learned how to do tests using minimal amount of equipment.

#### UPCOMING EVENTS

*Iowa Jewelers & Watchmakers Association  
Spring Seminar  
April 12, 1987  
The Highlander Inn – Iowa City, IA*

*Ontario Watchmakers Association  
50th Anniversary Annual Meeting & Banquet  
April 26, 1987  
Loews Westbury Hotel, 475 Yonge Street  
Toronto, Ontario CANADA*

*Wisconsin Horological Society Convention  
April 24, 25 and 26, 1987  
Eau Claire, WI*

*Horological Association of Virginia  
Annual Convention  
May 1, 2 and 3, 1987  
Fair Oaks Holiday Inn – Fairfax, VA*

*Texas Watchmakers Association  
40th Anniversary Convention  
May 1, 2 and 3, 1987  
Marriott Hotel – Austin, TX*

*North Carolina Watchmakers Association  
Annual Convention  
June 5, 6 and 7, 1987  
Holiday Inn North – Raleigh, NC*

*Watchmakers Association of Pennsylvania  
Annual Convention  
June 12, 13 and 14, 1987  
Holiday Inn East – Lancaster, PA*

*Watchmakers Association of Ohio Convention  
July 24, 25 and 26, 1987  
Marriott Inn East – Columbus, OH*

*Nebraska & South Dakota Jewelers Association  
82nd Annual Convention  
August 28, 29 and 30, 1987  
Midtown Holiday Inn – Grand Island, NE*

*Iowa Jewelers & Watchmakers Association  
Convention and Trade Show  
September 12 and 13, 1987  
Airport Hilton – Des Moines, IA*

# We're interested in your color slides.

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WTIES

## BENCH COURSES

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### PROGRAMS

- A Meter Microamps and Modules . . . . .Gerald G. Jaeger, CMW, CEWS
- B AWI Certified Citizen Quartz Watch Technician . .Buddy Carpenter, CEWS
- C Pulsar Quartz Analog Y590 and Y112 . . . . .James H. Broughton, CEWS
- D Seiko Quartz Combos . . . . .Leslie L. Smith, CMW, CEWS
- E Quartz Watch Test Equipment . . . . .Calvin E. Sustachek, CMW
- F Common Sense Quartz Watch Repair. . . . .Robert F. Bishop
- G ESA Digital/Analog 900.911 and ETA Analog 961.101 . . . . .William Biederman, CMW
- H ESA Analog Quartz Repair . . . . .James Adams, CMW
- I Using the Watchmakers Lathe. . . . .Archie B. Perkins, CMW
- L Introduction to Striking Clocks. . . . .Joseph G. Baier, Ph.D., CMC, CMW
- M Striking Clocks—Advanced Seminar . . . . .Joseph G. Baier, Ph.D., CMC, CMW
- N Introduction to Clock Repair . . . . .Ron Iverson, CMC  
 Jim LaChapelle, CMC
- R Introduction to Jewelry Skills. . . . .Marshall F. Richmond, CMW
- S Management Seminar. . . . .Fred S. Burckhardt
- T Retrofitting . . . . .Buddy Carpenter, CEWS  
 James H. Broughton, CEWS
- U Advanced Lathe Course . . . . .Archie B. Perkins, CMW
- V Antique Watch Restoration . . . . .Archie B. Perkins, CMW
- W Restoration of Fusee Watches. . . . .Ralph Geiger, CMW, CMC, CEWS

### INSTRUCTORS

<b>APRIL 1987</b>			
5	T	St. Paul, MN	CARPENTER
<b>MAY 1987</b>			
2	T	Schenectady, NY	CARPENTER
3	T	Rochester, NY	CARPENTER
17	T	Toronto, Canada	BROUGHTON
17	D	San Francisco, CA	SMITH

again measured and the pallet tips traced. The resulting drawings will illustrate the best compromise to be used in equalizing the lever arm ratios and recoils. Figure 22 shows that only a slight gain has been made toward equalizing the lever arm ratios. Figure 23, however, shows that nearly equal angles of incidence have been obtained. The final compromise decided upon was to slightly increase the angle of incidence on the entry pallet. This would cause an increase in the entry drop, allowing the center distance to be increased to a safe distance.

Figures 24, 25, 26 and 27 show the correct operation of this escapement following the final adjustments. Figure 28 shows the final lever arms. Figure 29 shows the final angles of incidence. The physical restrictions of this escapement dictated the necessity of equalizing only the angles of incidence and not the lever arm ratios. The lever arm ratios of this escapement could have been corrected either by severely opening up the span of the pallets or by moving the verge pivot point. Since this would have required extensive rework in either case, it was decided that the effort required, and the results obtained would exceed the overall level of quality of the movement. As a result, neither of these measures was employed.

#### **SPECIAL OVERHAUL CONSIDERATIONS**

Because the escapement is literally the heart of the clock movement, it should, but frequently does not, receive a great deal of close attention during the overhaul of the movement. There are a number of considerations that are not part of the actual operation of the escapement that must be taken into account if the escapement is going to operate at its peak capacity. Too often the escapement is suspected of being faulty when the problem lies elsewhere in the movement. For these reasons, a brief review of the major points that must be covered during the overhaul of a movement fitted with a recoil escapement is in order.

The best place to start any clock repair is with the basics, and any basic repair must start with a freshly cleaned movement. The mainsprings should be removed, cleaned, and lubricated. The train must be free, with all of the pivots polished and all worn holes bushed. The verge pivot holes or the verge saddle holes must be tight and lightly lubricated. Figure 30 shows the best method for closing the verge saddle holes in strip pallet escapements using a miniature anvil and a steel hammer. Once the holes have been closed, they should be re-opened with a round smoothing broach. This not only opens the holes but also burnishes and hardens them at the same time.<sup>2</sup> Also make sure that the crutch is firmly fastened to the verge. Any looseness here will interfere with the operation of the escapement by wasting precious power, often to the point of stopping the clock. Check the suspension spring chops on the strip pallet escapements and the suspension spring holding blocks on the others. They must not bind the suspension spring at any point, but they must be tight enough to prevent any noticeable side-to-side motion of the suspension spring. The crutch or crutch loop that contacts the pendulum must be straight, perpendicular to the back of the movement in all directions, and have parallel sides that allow only a minimum of side-to-side motion by the pendulum.



Figure 25. Full recoil of exit pallet.



Figure 26. Exit drop and entry lock.



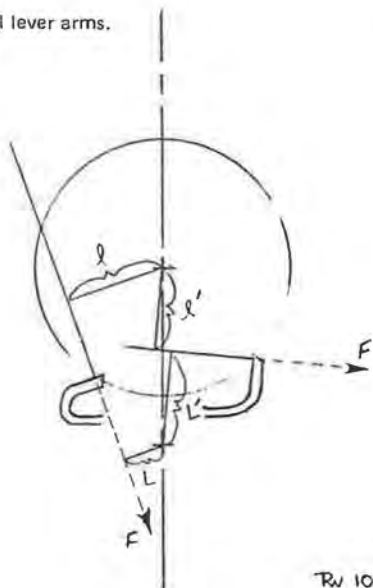
Figure 27. Full recoil of entry pallet.

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<sup>2</sup>Anderson, Norman J. and Timothy R. White, "The Strip Pallet Recoil Escapement." A slide/lecture presentation. 1983.

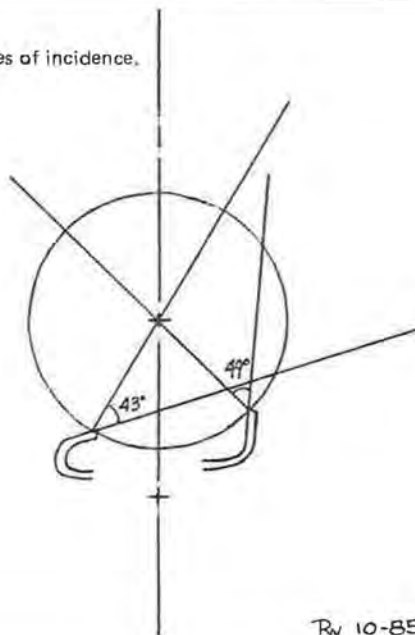


Figure 28. Final lever arms.



Rw 10-85

Figure 29. Final angles of incidence.



Rw 10-85

When the overhaul is finished, with all necessary repairs and adjustments complete, the only work remaining is lubrication. The train pivots should be lubricated with a high-grade, non-spreading clock oil. Levers and ratchets should be lubricated with grease. Finally, the pallets should be lightly wiped with a thin grease—NOT OIL. Oil should not be used on pallets as it would spread away from the active surface of the pallets due to the capillary action of the fine scratches left by the polishing process.<sup>3</sup> Only those pallets that are jeweled or mirror polished should ever be lubricated with oil. A light, non-sticky grease will be sufficient lubrication for all clock escapements from the fine French escapements to the coarse American movement.

### CONCLUSION

In this examination of the basic principles involved in the operation of the recoil escapement a number of parameters have been discussed that are common to all recoil escapements. The most important of these have been discussed at length: drop, lock, effective lever arm ratios, angles of incidence, recoil, and span. Although recoil escapements come in a wide variety of styles, shapes, and sizes, these common parameters maintain an essentially constant relationship to one another in all recoil escapements. In the course of this article we have seen how they relate to one another, how one can affect the other, and the relative importance of each. A thorough knowledge of all of this is essential for the efficient, correct repair of the recoil escapement.

The recoil escapement has been with us for many, many years. Current indications are that it will be with us for as long as mechanical clocks are being made. As clockmakers and repairmen, we cannot ask for an escapement that is more tolerant, reliable, and easy to work with than the recoil escapement. Every clockmaker and repairman owes it to himself and his customers to obtain and maintain a full working knowledge of this versatile escapement.

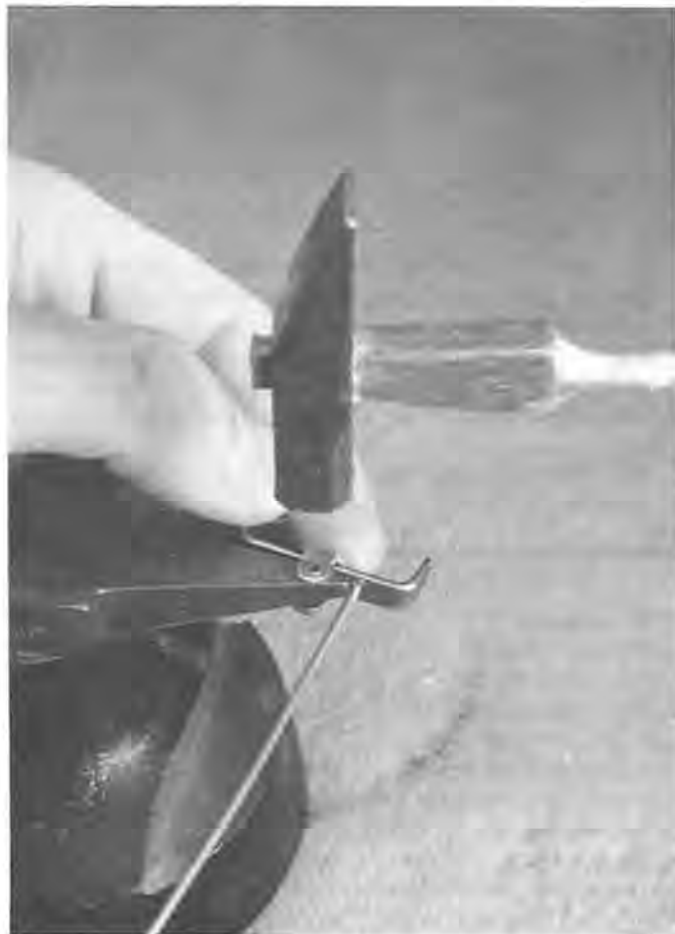


Figure 30. Closing saddle holes on a strip pallet verge.

<sup>3</sup>Rugole, Joseph, "Watch Adjustments". *Horological Times*, AWI Press: Cincinnati, OH. October 1979. pg. 37.

# New Products and Literature



## SEIKO'S NEW DUO DISPLAY ANALOG/DIGITAL

The new Duo Display analog/digital watch from Seiko with alarm and day/date calendar offers practicality and fashion in a timepiece. Sleek dorphine hands and gilt hour markers glitter against a metallic grey grid dial set in a gun-metal grey case. The sturdy, matte grey bracelet has polished grey trim accents, giving a high-tech look.

The watch is available from Seiko's nationwide network of authorized distributors.

Show are included, along with mainstays of the line. Quantities became available for participating jewelers March 1, 1987, and are still available.

Other merchandising and display aids have been created and also are being offered to stocking dealers. They feature the "Significant Moments" theme which has distinguished the "Constellation" collection. A "Significant Moments Scrapbook" display that can showcase up to 10 models and a smaller single-model version have been developed for case exhibits.

For more information, contact: Lynn Smotzer, Omega Watch Corp., 35 East 21st St., New York, NY 10010.

## SLIM WATCHES FROM WALTHAM

These watches' lean, sleek lines accentuate their extreme slimness. Steel and 20-micron gold-plate make up their two-tone styling. The cases are water-resistant to 30 meters. The watch has a quartz movement, sapphire crystal, and raised Arab or Roman numerals on the dial. For further information, contact: The Waltham Watch Co., 33-00 Northern Blvd., Long Island City, NY 11101; (718) 361-7721.



## NEW FORMULA WATCH BATTERIES FROM RAYOVAC

Rayovac Corporation has announced a new improved formula silver-oxide watch battery that offers stable operating voltage, long shelf life, and protection against leakage. Because of technological advances in construction and chemical formulations, Rayovac's silver-oxide watch batteries are designed for all types of watches, even those with added functions.

The new construction allows for improved cell contact, maximum leakage protection, and improved shelf life. The new chemical formulation improves

pulse and rate capabilities and low temperature performance.

For more information, contact John Wieber, Rayovac Corp., 601 Rayovac Dr., Madison, WI 53711.

## 1987 EDITION OMEGA CATALOG PUBLISHED

A comprehensive, four-color catalog of the "Constellation" watch collection has been published by Omega Watch Corporation. The full assortment, which now numbers 60, is illustrated in the 22-page booklet. The new gray dial versions that are being introduced for 1987 at the Jewelers of America New York Trade

## DOUBLE CLIP WORK HOLDER FROM FOREDOM ELECTRIC

The Foredom Electric Company has announced the introduction of a double clip work holder to its product line. The bench clamp feature of the work holder helps free up table top work space and ensures stability better than free-standing bases, a company spokesman states. Spring clips swivel, tilt, or rotate to any position at a height up to 14" for working convenience and comfort. The double clip work holder is one of several versatile bench tools offered by Foredom that also include handpiece holders and vise holders.

For more information on this or other Foredom products, contact: The Foredom Electric Co., Rt. 6, Bethel, CT 06801; (203) 792-8622.

## FOREDOM

### Double Clip Work Holder

Model CH-1

- Adjusts up and down to maximum height of 14" above bench
- Spring clips swivel, tilt, rotate to any position





Electronics



Modeling



Jewelry

A "third hand" for every work bench and shop

Holds circuit boards, switches, wires, and parts in position for soldering, welding, gluing, and assembly work. Sturdy steel rod in cast iron clamp to base and slides up or down to meet comfortable work height. Attaches to table or bench tops up to 1 1/2" thick.



**FOREDOM**

Double Clip Work Holder from Foredom Electric Co.

Waltham

## NEW CATALOG FROM RIO GRANDE

Offering tools and equipment featuring the latest technology, the 1987 Rio Grande Albuquerque Tool Catalog features 347 new products and is RGA's biggest catalog ever. It is 148 pages of color photographs and copy, including a new chart of eye loupe comparisons and characteristics and terms of magnifiers.

Among the new items offered is RGA's vacuum casting and investing machine, The Little Giant. Designed by casting experts and developed by RGA, The Little Giant does the job of larger, more expensive casting equipment. It features a 12" bell jar and a design that eliminates the problem of clogged vacuum lines.

This catalog is available free. Contact: **Rio Grande Albuquerque, Inc., 6901 Washington, NE, Albuquerque, NM 87109.**



Rio Grande's New Catalog

## NEW ACU-MIN SERIES OF TWEEZERS FROM MOODY TOOLS, INC.

A new series of Acu-Min stainless steel, anti-acid and anti-magnetic tweezers is now available from Moody Tools. Designed for industrial use, the tweezers come in a variety of sizes and configurations to suit

any assembly operation where accuracy and precision are a must. Six models are available, including multi-purpose straight AA-SA, and strong pointed straight OO-SA tweezers for general assembly applications. Flat-tipped 2A-SA tweezers with long, thin rounded tips are designed for use on semiconductor wafers. Pointed straight 3C-SA tweezers with fine, accurate honed tips are used for microelectronics, while the extra thin, needle-like tips of the sharp pointed 5-SA tweezers offer greater visibility under magnification for die attachment and wire bonding. Curved pointed 7-SA tweezers round out the series, and are designed for working on microminiature assemblies where increased visibility is required.

For more information on the Acu-Min series of industrial tweezers, contact: **Moody Tools, Inc., 42-60 Crompton Ave., East Greenwich, RI 02818; (401) 885-0911.** A copy of the new Moody Hand Tools Catalog, featuring over 400 miniature hand tools and new precision measuring devices, is also available by sending \$2.00 to the above address.



Acu-Min Tweezers from Moody Tools, Inc.

## GESSWEIN'S TABLE GAUGE

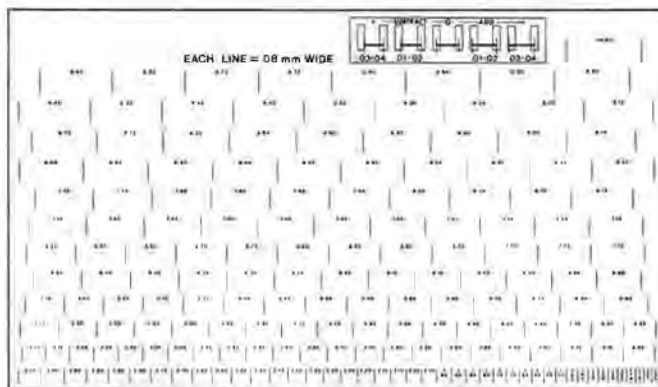
This Table Gauge from Gesswein has been designed for measuring items inaccessible by micrometer or caliper. This gauge offers micro accurate measuring to .01 millimeter. The table gauge is a fast and accurate scanning

method which enables you to determine measurement without computing between marks, as on a conventional scale, a company spokesman claims.

This template is a standard millimeter scale divided into

.05 millimeter increments. It measures from 1.00 to 10.00 millimeters, and is also designed for use under magnification.

Contact: **Gesswein, 255 Hancock Ave., Bridgeport, CT 06605; (203) 366-5400.**



Gesswein's Table Gauge, designed for measuring items inaccessible by micrometer or caliper.



## PULSAR LADIES' ANALOG SLIM DRESS PAIR

Fashion jewelry styled bracelets on this new pair of ladies' analog slim dress quartz models PMG004 and PMG002 (left to right) symbolize the elegance in Pulsar's Spring 1987 collection. Both models have delicate goldtone teardrop link bracelets, round goldtone cases, and gilt hands and markers at 12 o'clock against gilt dials. Model PMG004 is enhanced with black enamel accents on the teardrop link bracelet and round bezel. These models have mini quartz movements encased within the petite structures. Priced at \$175 each suggested retail, both models have mineral crystals and approximate two-year battery life.

For more information, contact **Pulsar Time, 1111 Macarthur Blvd., Mahwah, NJ 07430; (201) 529-2400.**

# New Products and Literature

## WATCH INDUSTRY NEWS BULLETIN FROM ETA INDUSTRIES

"Swisstec Information," an illustrated, four-page bulletin available free from ETA Industries, Inc., offers watch-industry news for retail jewelers, manufacturers, and watchmakers. The current issue describes technical catalogs of ETA movements and an eight-language watchmakers' dictionary; a free brochure designed to improve retail selling of quartz watches; a free battery change chart with illustrated step-by-step instructions; and one of the world's most comprehensive training courses for watchmakers.

Copies of Swisstec Information are available by writing: **ETA Industries, Inc., 8 West 40th St., New York, NY 10018; (212) 302-2222.**

## SELVYT POLISHING CLOTH FROM B. JADOW

B. Jadow and Sons, Inc. helps you "polish up your act" with the Selvyt® Polishing Cloth. This cloth is available in five sizes (stock numbers PS-250 through 254). It is lint free, and comes individually wrapped for cleanliness and protection. It is available at your Vigor® distributor, or contact: **B. Jadow and Sons, Inc., 53 West 23rd St., New York, NY 10010-4275; (212) 807-3800.**

Selvyt Polishing Cloth



## KASSOY'S 1987 CATALOG

Kassoy has announced the publication of their full color 1987 catalog. There are 56 separate categories of tools, scales, testing equipment, loupes, ultrasonics, etc., with 63 new items being introduced.

Catalogs can be obtained by writing or calling: **KASSOY, 32 West 47th St., New York, NY 10036; 1(800) 4-KASSOY.**



Kassoy's Catalog

## "EXTRA HANDS" FROM MG INDUSTRIES

A new work-holding and heat-insulating product—Extra Hands—is being introduced by MG Industries. Extra Hands is specially designed to precisely position delicate parts while being soldered or brazed. The product also works as a heat shield, protecting valuables from damage. (For example, Extra Hands can protect precious gems in their settings while delicate soldering is done nearby.)

Extra Hands is easy to mold and is reusable. It adheres to most surfaces, but releases fully. It can withstand temperatures as high as 3000°F. It contains no asbestos and is non-toxic.

This new product is available through jewelry wholesalers. Contact your wholesaler or **MG Industries at 1(800)558-8524** for more information.

Extra Hands from MG industries is a new work-holding and heat-insulating product. It is specially designed to position delicate parts while being soldered or brazed. It can also be used as a heat shield.

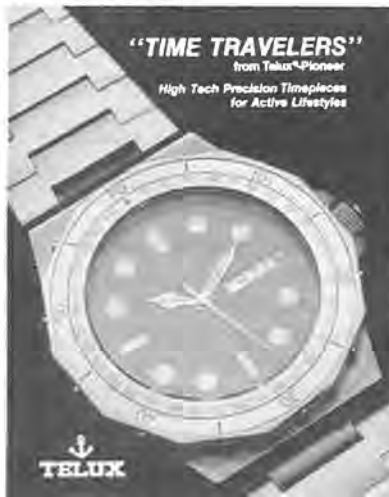


## "TIME TRAVELERS" FROM TELUX-PIONEER, INC.

A full-color, six-page brochure details the "Time Travelers" line from Telux-Pioneer, high-tech timepieces for active lifestyles. Styles included in the brochure are four models of the Flight Deck Series, the Trident Series of diver's watches, and the four model Country Club Set. A private label watch program is offered to dealers as well.

For further information, contact: **Telux-Pioneer, Inc., 43-06 58th St., Woodside, NY 11377; (718) 899-5115.**

Telux-Pioneer, Inc.



## APOLLO INTRODUCES PORTABLE, MODULAR LASER MARKING SYSTEM

Apollo Lasers, Inc. is introducing what it claims to be the industry's most flexible and versatile laser marking system for both user and OEM applications.

Based on unique modular configuration, this compact, portable system contains separately stackable power, cooling, laser head, IBM compatible micro-processor and LCD display keyboard units, each fully enclosed and designed to be stacked or separated to fit any tight production space requirements.

Both dot and script versatility cover all lettering, bar coding, and graphics requirements and can be easily and inexpensively expanded by accepting up to 20 custom PROM chips.

Large working field of up to 8" accommodates rough and uneven surfaces, covering a range of materials from lightweight plastic and thin sheet metal to heavy castings.



#### TIME TO SPARKLE

Bulova focuses on diamonds in 1987 with these new watchmates. Each quartz timepiece features a sparkling diamond at 12 o'clock on a black sunray dial with a contrasting brass bezel ring and a gold-tone link bracelet. The models illustrated are: his (92N47), with a suggested retail price of \$250, and hers (92J87), at a suggested retail of \$225. For more information, contact **Bulova Watch Co., Inc., Bulova Park, Flushing, NY 11370; (718) 565-4200.**

For further information on Apollo Laser's Marking System contact Bill Latto at (818) 407-3000, or write to **Apollo Lasers, Inc., 20977 Knapp Street, Chatsworth, CA 91311.**

#### FREE SOURCE BOOK FOR ELECTRONIC TECHNICIANS

This new source book from Contact East features their 1987

full line of tools and instruments, including hundreds of new products. All products are described in detail with specifications, full color photos, prices, and are 100% guaranteed. To receive a copy and one year of technical supplements, write: **Contact East, P.O. Box 786, North Andover, MA 01845; (617) 682-2000.**



#### VOGUE: FASHIONABLE DESIGN FROM LONGINES

Catching the eye with watches that have a fashionable look about them has long been the tradition at Longines, Saint-Imier (Switzerland).

The Longines designers were inspired by the current youthful and eye-catching fashions when they created these 20 micron gold-plated models with their square cases set between two slim lines of beading (the godroons) which serve to link the watch to the soft and supple kangaroo skin strap. Each model comes in a choice of four versions: fancy dials, dials with indexes, arab numerals, white or gilt backgrounds decorated with light concentric beading to harmonize with the godroon of the case.

For more information, contact: **Longines, 2610 Saint-Imier, Switzerland.**



## HATTORI SEIKO TO ACQUIRE MAJORITY SHARE OF MATRA HORLOGERIE

Hattori Seiko Co., Ltd. recently announced that it will acquire the majority shareholding of Matra Horlogerie (headquarters in Paris). Matra Horlogerie is the distributor of Seiko products primarily in France and Belgium, and also manufactures and distributes watches and clocks under such brand names as JAZ and Yema. Matra SA, a nationalized corporation in France, has been the majority shareholders of Matra Horlogerie, while Hattori Seiko has held a minority shareholding. Hattori Seiko and Matra SA have been in discussion for some time with a view to further developing the activities of Matra Horlogerie, and as a result the majority shares of Matra Horlogerie will be transferred to Hattori Seiko from Matra SA. Hattori Seiko will then assume the responsibility of managing Matra Horlogerie, and the name of the company will be changed to "Compagnie Générale Horlogère."

The cooperation between Hattori Seiko and Matra Horlogerie has been favorably received in France from the viewpoint of developing the watch and clock industry. Both parties believe that this commitment will bring about not only growth in the French watch and clock industry, but will also assist the favorable development of relations between France and Japan.

## HONG KONG JEWELRY FAIR SET FOR SEPTEMBER

Some 1,200 American visitors and up to 20 United States exhibitors are expected at the Fifth Annual Hong Kong Jewelry and

Watch Fair to be held September 14-17 in five of Hong Kong's leading hotels.

Last year's fair attracted 15,800 visitors from 52 countries, and generated \$64 million worth of business. The number of visitors was up by 26 percent over the previous year.

The four-day fair will be held at the Regent, New World, Sheraton, Shangri-La, and Golden Mile Holiday Inn Hotels, providing a total exhibition area of 68,000 square feet, up from 50,000 square feet last year.

Concurrent with the fair will be the JWF Award competition. An international panel of judges will award prizes to pieces of jewelry in four categories: rings; necklaces or bangles; jewelry sets; and objects d'art or watches. All exhibitors will be eligible for the competition.

Admission to the exhibition of competition entries will be free to all trade buyers, but they are advised to pre-register with the organizers, Headway Trade Fairs, Ltd., 9/F Sing Ho Finance Bldg., 168 Gloucester Road, Hong Kong.

## CFH ANNOUNCES 1987 2- AND 4-MONTH MANAGEMENT COURSES

The annual programs on Retail Jewelry Management offered by CFH will start on July 6, 1987 in Lausanne, Switzerland.

The Store Management Course (8 weeks) covers the whole range of manager's activities in the fields of Finance, including a practical approach to computerization, Marketing and Communications, Leadership and Staff Management, where participants acquire specific managerial skills.

The Product Knowledge

and Salesmanship course (8 weeks) focuses on sales training methods directly related to gold and diamond jewelry, color stones, pearls and watches. The objective is to review and improve product knowledge and training skills to be used by managers in educating their own staff.

The four-month Comprehensive Course offers a wide coverage of both Jewelry Retail Management and Sales training, providing in concentrated form and a minimum of time a global approach to Jewelry Retailing.

The CFH Institute, the Jewelers' International School of Business Management, has been at the service of the industry and trade for 23 years. During this time thousands of participants have come to Lausanne from 70 countries.

For detailed programs and information, write to: **CFH, Case postale 371, 1001 Lausanne, Switzerland.**

## OMEGA U.S. CORPORATE OFFICES RELOCATE

Omega Watch Corporation has moved into new corporate headquarters at 35 East 21st Street. The new 6,500-square-foot space houses all sales and marketing offices, accounting, plus a showroom facility.

According to Jacques Irniger, president, the new location has allowed parent company SMH to complete consolidation of its executive offices in the U.S. Irniger recently was named president of SMH-US. Additionally he heads Swatch, which joins Omega at the new address in Gramercy Park, Manhattan's newest business hub.

The new mailing address for Omega is: **35 East 21st Street, New York, NY 10010;**

phone number is (212) 505-6150.

## NYC POLICE RECEIVE PULSAR AWARDS

Five police officers of New York City's Police Department, including one policewoman and one retired officer, were named recipients of the 1986 Pulsar "Nick of Time" Awards for courageous acts of valor in which "time was of the essence," it was jointly announced at a special award ceremony held by the Honor Legion of the Police Department of the City of New York, the Department's oldest fraternal organization, and Pulsar Time, the watch manufacturer.

Those honored were police officers Delia Lopez, Thomas Gavin, Dennis Quinn, and Paul Yurkiw, as well as retired police officer Edward del Pino, a 24-year veteran of the NYC police force. They were selected by the Honor Legion upon recommendations of Precinct commanders.

"Today's honorees have a common bond: they acted with extraordinary heroism in life-threatening situations when they had only seconds in which to respond," stated Mortimer Gershan, Pulsar Time's President, at the award ceremony. "It is to salute this special kind of courage that Pulsar, in association with the Honor Legion, has created these special awards for these special people," he said.

## THE ATMOS — A TRIBUTE TO AMERICA'S MEN OF STYLE AND ACHIEVEMENT

The Atmos timepiece, named this year's symbol of achievement by the Men's Fashion Association,



Pulsar Time honored five heroic NYC Police Officers as recipients of the 1986 Pulsar "Nick of Time" Awards for courageous acts of valor in which "time was of the essence." Each of the meritorious police officers received a plaque and a Pulsar watch. At the awards ceremony (L to R): Mort Gershman, president of Pulsar Time; police officers Dennis Quinn, Edward del Pino, Paul Yurkiw, Delia Lopez, Thomas Gavin, and Detective William Abromaitis, President of New York City Police Department's Honor Legion.

was recently presented to recipients of the Hall of Fame Award at the 1986 American Image Awards.

The American Image Awards, sponsored by the Men's Fashion Association, are presented annually to those men in various fields of endeavor who best exemplify the American standard of success and style.

John L. Davis, president of Longines-Wittnauer Watch Co., the distributors of the Atmos in the United States and Canada, made the presentations before leading executives of men's fashion industry at the awards banquet held at New York City's Sheraton Center Hotel. Hall of Fame honorees for 1986 were entertainer and humanitarian Alan King, and the apparel industry's Jerome S. Gore, chairman emeritus of the Hartmarx Corp., and William R. Howell, chairman of J.C. Penney Company.

In addition, 1986 American Image Award winners, voted by the fashion press and apparel industry, included: Mikhail Baryshnikov, arts; Lee Iacocca, busi-

ness; Peter Jennings, communications; Michael J. Fox, contemporary; Paul Newman, film; Senator Bill Bradley, public service; Joe Montana, sports; and Bill Cosby, television.

Hosting the evening's festivities for the Men's Fashion Association were Knots Landing television star Ted Shackelford and model Jerry Hall. Both Ms. Hall and Mr. Shackelford were given Longines 1000 watches by John Davis for contributing to the success of the evening.

Previous recipients of the American Image Hall of Fame Awards have been such celebrities as Bob Hope, Douglas Fairbanks, Jr., and Henry Fonda. However, this year was the first time the honorees were presented with Atmos clocks.

#### JAMROZ JOINS BULOVA

Richard C. Jamroz has been named Director of Communications and Sales Promotion for Bulova Watch Company, Inc., it was announced recently by Robert



John L. Davis, President of Longines-Wittnauer Watch Co., presented the Longines 1000 to Ted Shackelford, star of television's *Knots Landing*, at the American Image Awards, sponsored by the Men's Fashion Association. Mr. Shackelford and model Jerry Hall were co-hosts of the evening's festivities honoring America's men of style and achievement.

E. Ryan, Vice President, Marketing. In his new position, Jamroz will be responsible for the firm's advertising, sales promotion, and public relations.

Mr. Jamroz's career spans more than 25 years in advertising, marketing, and sales, including 13 years' experience in the watch and jewelry industry. He was previously Vice President, Sales and Marketing for Norvell-Marcum Company in Tulsa, OK.

#### THREE PRESENTATIONS AT BASEL '87 FAIR

Three special presentations are scheduled for this year's European Watch, Clock and Jewellery Fair (also called Basel '87) which brings together over 1,800 exhibitors from April 23 to 30 in Basel, Switzerland.

The Swiss Official Control presents an exhibition of fake and counterfeit precious-metal ingots, watches, metal and gem-set jewelry in Hall 211 (Building C) at the Fair. The theme of this exhibition is "Genuine, Fake, or Falsified?" A demonstration of assay methods for gold, platinum and silver objects is also scheduled. Films and practical exercises will be used to inform visitors on the way such objects are checked and evaluated. Of-

ficial assayers will be on hand to answer questions relating to precious metals and the relevant legislation.

The International Colored Gemstone Association will be exhibiting a series of designs in gold, platinum and silver set with natural colored gemstones. These pieces are all entered in the "Gemmy Award" contest open to jewelers everywhere. The winner will be announced by an international jury on April 16, 1987 in Geneva. Along with ruby, sapphire and emerald, colored gemstones include many gemological groups and an extraordinary variety of gemstone types (Hall 112 in Building A).

A number of independent European watchmakers and designers have formed the association of Horological Academy of Independent Creators. Their aim is to preserve and promote the spirit and traditions of classic watchmaking, and to highlight the unique character of handmade timepieces and to recruit young watchmakers who will perpetuate those traditions. To familiarize the time-product and jewelry industries with their activities and production, they decided to stage a collective exhibit this year in Basel (Hall 125 in Building A).

# 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. Classified Display Ads are \$25 per column inch. 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 1).

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

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**WATCHMAKER WANTED.** Experienced only, for position in a central California guild store. Knowledge of mechanicals, quartz, and Rolex required. Public contact required. Send resume and references to: Box HW2387, *Horological Times*, 3700 Harrison Ave., P.O. Box 11011, Cincinnati, OH 45211.

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# Dates To Remember

# Ad Index

## APRIL 1987

- 5- Retrofitting Bench Course (AWI); Buddy Carpenter, instructor; St. Paul, MN.
- 5- Dial Foot Soldering Seminar, sponsored by Watchmakers Association of Ohio; Park Motel, Canton, OH. For more information contact Jack St. Cyr, 5323 Edgeview Rd., Columbus, OH.
- 12- Iowa Jewelers & Watchmakers Association Spring Seminar; The Highlander Inn; Iowa City, IA.
- 23-30-BASEL '87 European Watch, Clock and Jewellery Fair, Basel Switzerland. Tel. 61-26-77-00, telex, 62982 lits ch.
- 24-26-Wisconsin Horological Society Convention; Eau Claire, WI.
- 26-Ontario Watchmakers Association 50th Anniversary Annual Meeting & Banquet; Loews Westbury Hotel, Toronto, Ontario. For more information: R.R. 1 Cookstown, Ontario L0L 1L0. Phone (705) 458-9221.

## MAY 1987

- 1-3-Horological Association of Virginia Annual Convention; Fair Oaks Holiday Inn; Fairfax, VA.
- 1-3-Texas Watchmakers Association 40th Anniversary Convention; Marriott Hotel, Austin, TX.
- 2-Retrofitting Bench Course (AWI); Buddy Carpenter, instructor; Albany, NY.
- 3-Retrofitting Bench Course (AWI); Buddy Carpenter, instructor; Rochester, NY.

17-Retrofitting Bench Course (AWI); James Broughton, instructor; Toronto, Canada.

17-Seiko Quartz Combos Bench Course (AWI); Leslie Smith, instructor; San Francisco, CA.

## JUNE 1987

- 5-7-North Carolina Watchmakers Association Annual Convention; Holiday Inn North; Raleigh, NC.
- 12-14-Watchmakers Association of Pennsylvania Annual Convention; Holiday Inn East; Lancaster, PA.
- 27-28-American Watchmakers Institute (AWI) Annual Board of Directors Meeting; Drawbridge Inn and Convention Center; Ft. Mitchell, KY.

## JULY 1987

24-26-Watchmakers Association of Ohio Convention; Marriott Inn East, Columbus, OH.

## AUGUST 1987

28-30-Nebraska & South Dakota Jewelers Association 82nd Annual Convention; Midtown Holiday Inn; Grand Island, NE.

## SEPTEMBER 1987

12-13-Iowa Jewelers & Watchmakers Association Convention and Trade Show; Airport Hilton; Des Moines, IA.

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