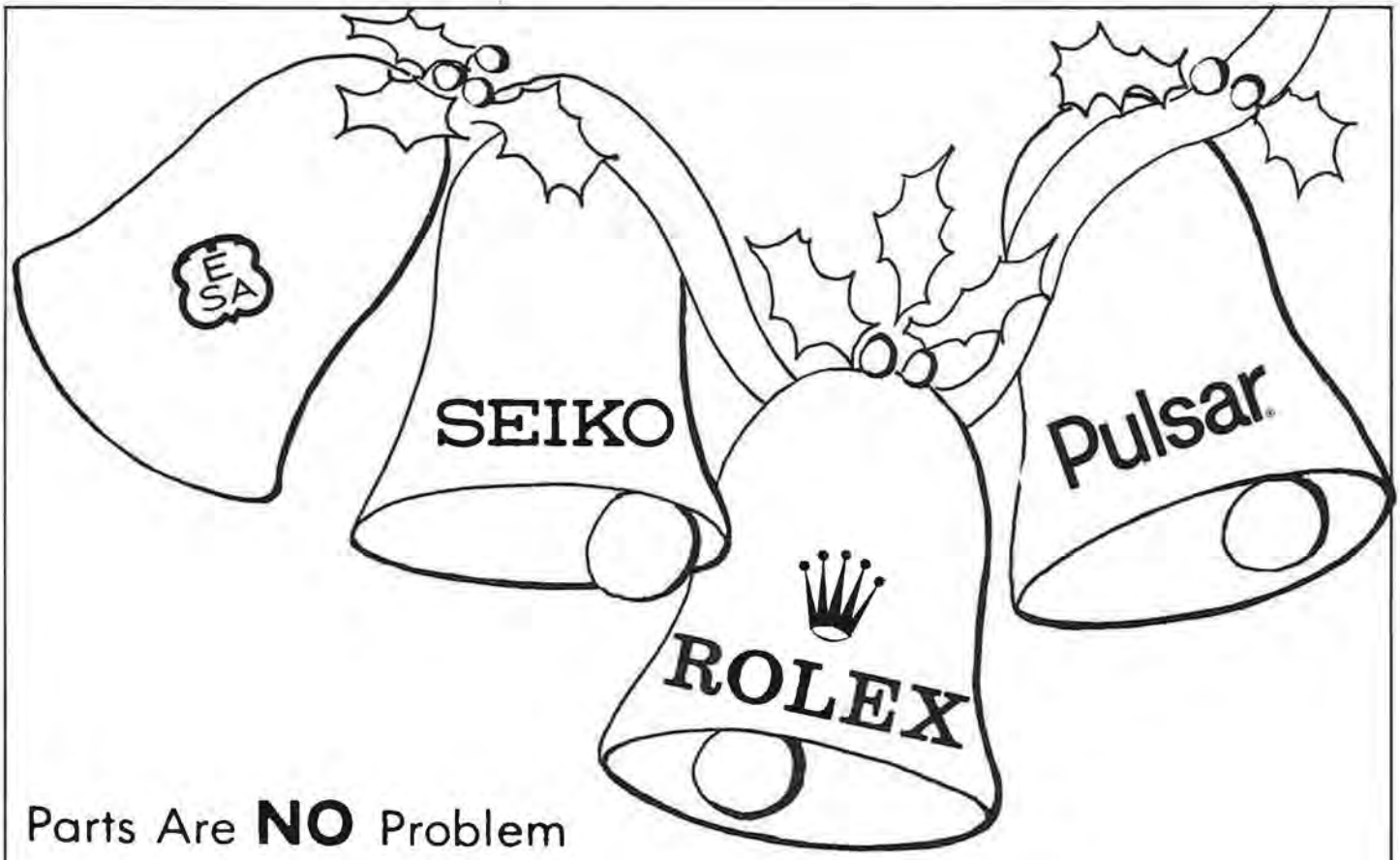
DECEMBER 1982

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VOLUME 6, NUMBER 12 DECEMBER 1982

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Official Publication of the American Watchmakers Institute

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HOROLOGICAL TIMES (ISSNO145-9546) is published monthly and copyrighted by the American Watchmakers Institute, 3700 Harrison Avenue, Cincinnati, Ohio 45211. Subscription, $35.00 per year, $4.50 per copy in the United States and $45.00 per year, $5.50 per copy outside the United States. Second class postage paid at Cincinnati, Ohio. POSTMASTER: Send address changes to HOROLOGICAL TIMES, P.O. Box 11011, Cincinnati, OH 45211.

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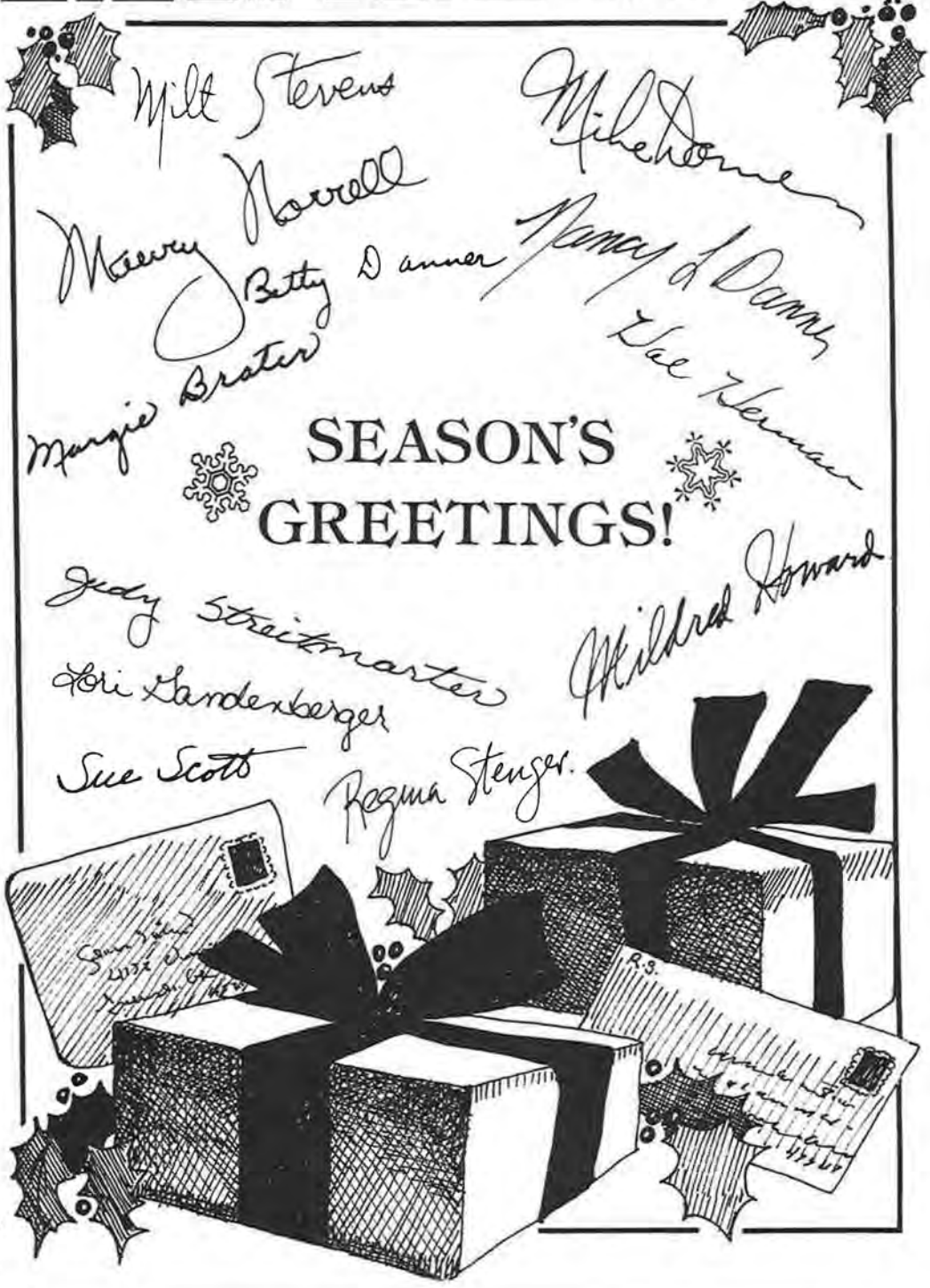
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210 Roman



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210-1	Roman-Gold Bezel & Dial	11.95	10.95	8.95	7.95
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This versatile and extremely accurate movement with its beautiful chime tones would be a welcome addition to any room. Can be used with or without pendulum. Comes complete with hands and pendulum.

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President's Message / Marshall Richmond



More on AWI Educational Programs

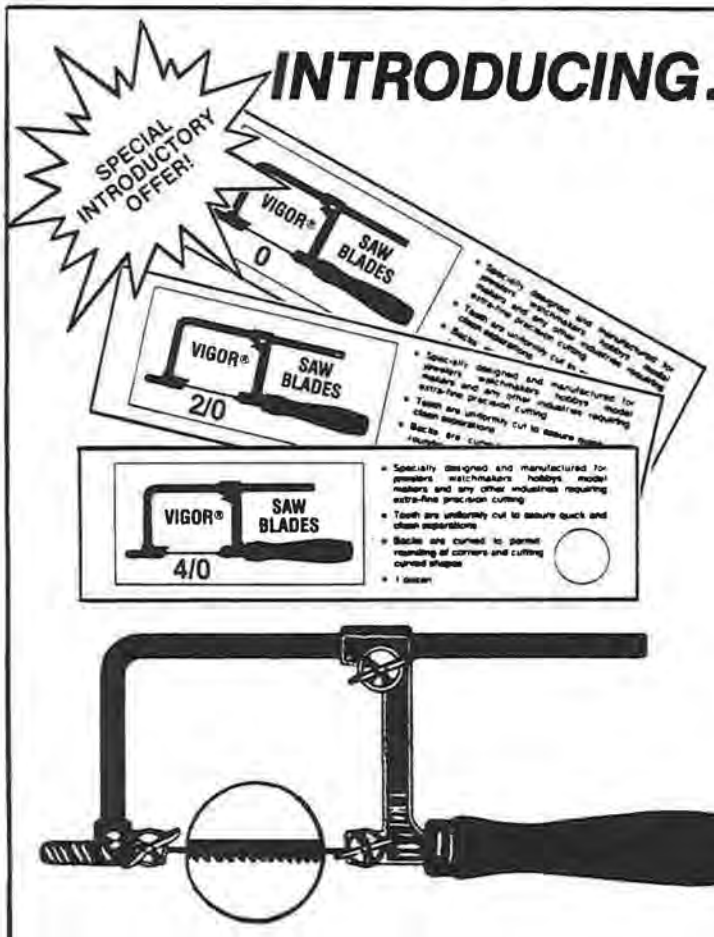
Programs are available from the American Watchmakers Institute for affiliate chapters and watchmakers' groups. They include speakers on almost any horology-related subject, sound film programs, sound slide programs, program aids such as large model escapements that can be loaned, and of course the traveling "Bench Courses."

Every affiliate chapter can have a speaker once each year for one half of his travel expenses as the AWI pays the other half. More than once a year the affiliate chapter only pays his expenses as these speakers give their services to make their contribution to bettering the horological profession. The sound slide or sound film programs are free and transportation charges paid to the recipient but must be returned immediately after their usage at the transportation expense of the affiliate chapter. The large model escapements and other training aids are loaned out on about the same basis. The bench courses on electric and electronic timepieces must be arranged through AWI Central. There is a minimum and maximum number required to attend and a cost per attendant. The instructors are excellent and everyone gets a movement to work on, with instructions on servicing them. These programs have become quite popular and many watchmakers are now servicing all electrics and electonics that cross their benches as a result of these bench courses.

A brochure is published annually that lists all the programs available. It is mailed out every year with the annual affiliate chapter membership packet. Watchmakers that are not in an affiliate chapter area or do not belong to an affiliate chapter find it more difficult to have these programs available to them, but if they are an AWI member, AWI Central will try and work out programs for their area.

Although some programs are available through manufacturers' sales offices, today most update educational programs come from or through the American Watchmakers Institute. Years ago, almost all of the information for watchmakers had to come from the watch manufacturers and mater-

(Continued on page 9)



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Our Readers Write

Idaho Reader Extends Hearty Invitation

You can't imagine the thrill I felt in reading the October issue of *Horological Times* magazine, when I turned to page 38 to see my father's picture along with the wooden watch he made during 1942 to 1946. The watch is still here at the store he started, and I'd like to invite any of your readers who might be in the area to drop in and see it. The town of Preston is in the southeastern area of Idaho about 65 miles south of Pocatello, and about 28 miles north of Logan, Utah.

We are proud of this accomplishment, and it's a real memento of dad's ability and life's work. He passed away in 1964.

Wayne W. Merrill
Preston, Idaho

Thank you very much. The material you sent was very helpful in solving the problems that I had.

So far my membership in AWI has been very rewarding, and I wish I had known about it a long time ago so I could have been a member much sooner. Thank you.

Robert Bosworth
Nebraska City, Nebraska

I enjoy the *Horological Times* magazine. It contains a wealth of information.

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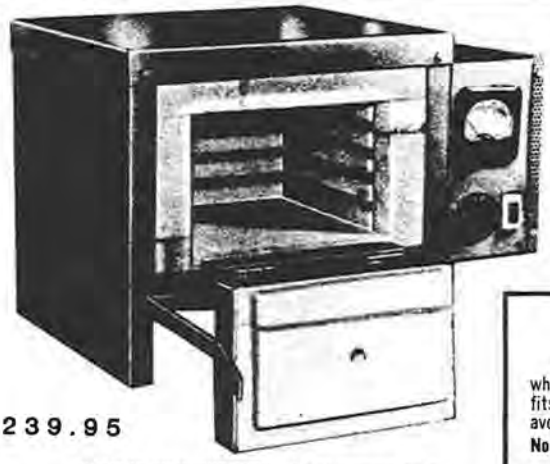
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THE PRESIDENT'S MESSAGE

(Continued from page 4)

ial distributors, but due to the high cost of printing and distribution, parts catalogs are hardly available, and educational programs almost extinct. AWI members that do not belong to an affiliate chapter or a local guild will find that it really pays big dividends to belong and participate.

The news media has so negatively played up the poor economy of this great country that many watchmakers have taken a negative outlook on their service business. The latest report I heard on television was that the unemployment rate had gone over 10%. It is small consolation for any one of the 10% to say that 90% are working, but that is the way it is. This means that this 90% is still drawing the same or better pay than they did a few years ago, and most of it is being spent. If inflation has slowed down as the media reports, then those working are holding their own. This should affect us in a positive way, for when people think of "hard times" they have a tendency to have old articles repaired rather than buy new. Think positive, and go out and get this business. It will put bread on your table, and butter on the bread!!

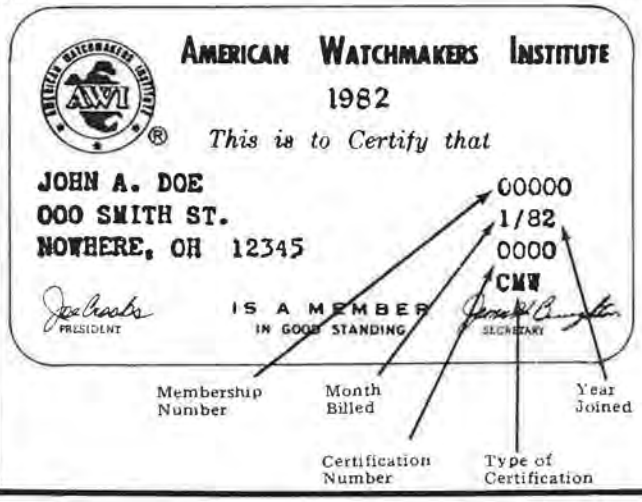
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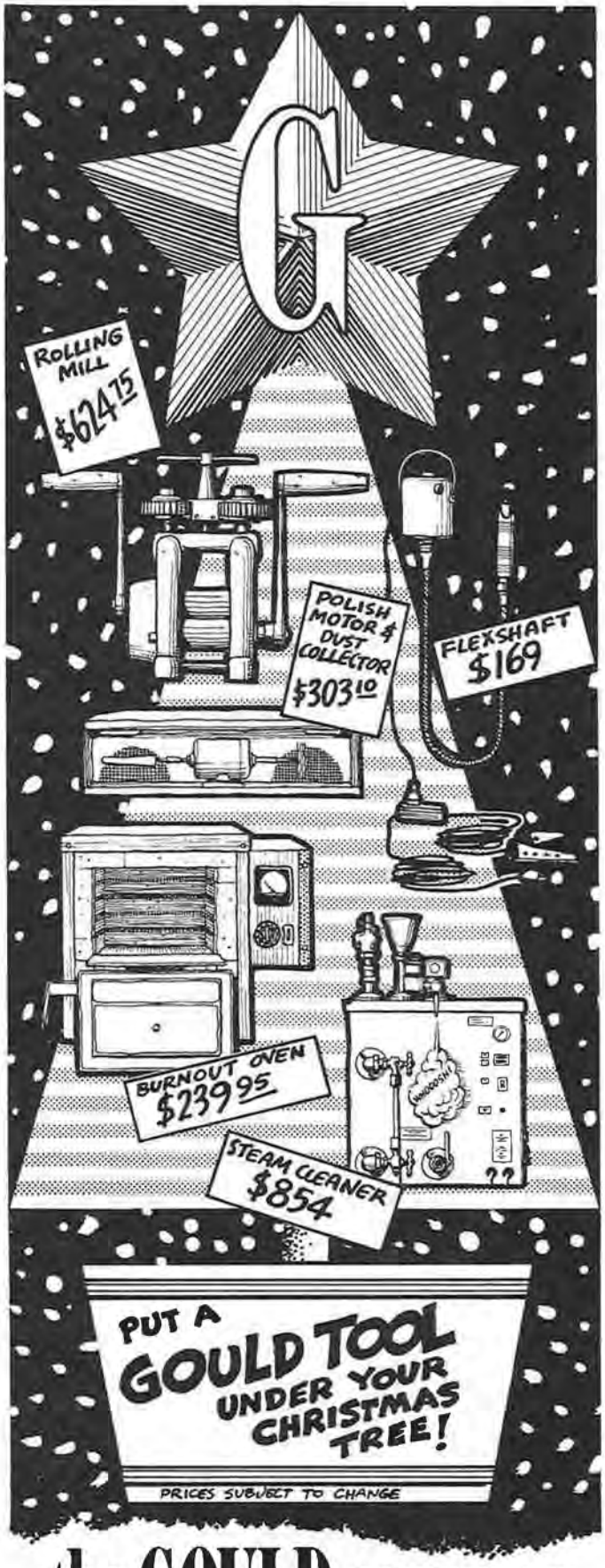
Your AWI membership card signifies that you are entitled to the many services offered by your association. However, we must have the correct information from your card to be able to serve you most efficiently.

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

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Technically

WATCHES

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HOW TO USE The Modern Watchmaker's Lathe

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Part IV

Some of the more common uses for the watchmaker's lathe are: altering balance staffs and stems, polishing pivots, removing broken balance staffs from balance wheels, altering jewel settings, and making balance staffs, stems and jewel settings. The lathe is also used to make tools used in repairing of watches and clocks. There are many other uses for the watchmaker's lathe which will be discussed, as well as the uses just mentioned, in future articles.

One very important tool that is needed when using the watchmaker's lathe is the hand graver. Figure 1 shows an assortment of hand gravers. These gravers can be purchased from your local watch material distributor. The handles can be purchased separately. Two of the most used graver shapes are the square cross section and the lozenge cross section gravers. The graver with the square cross section is used for general turning and the one with the lozenge cross section is used for undercutting shoulders and cutting out balance staffs. This graver can be sharpened with a long thin point. The lozenge graver has an elongated diamond shape cross section. Both the square and lozenge graver come in sizes from 0 to 20, size 0 being the smallest and size 20 being the largest. The most recommended sizes for watch work are 4, 5, 6, 7, and 8. The recommended sizes for the handles are 3/8 inch for smaller gravers and 7/16 inch for medium size gravers, and 1/2 inch for larger gravers. Square high speed steel gravers can be purchased in sizes from 1 to 8 from your watch material distributor. High speed steel holds up much better than high carbon steel.



Figure 1.

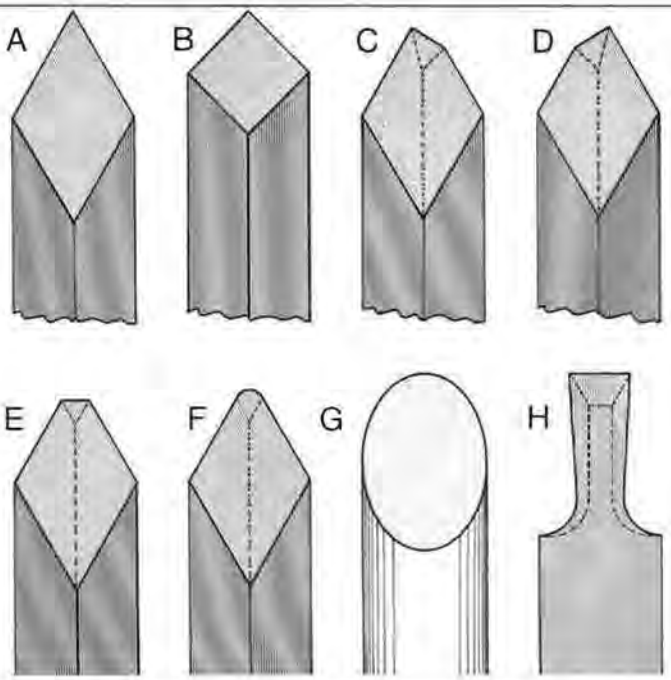
Square high carbon steel gravers can be made if the watchmaker chooses. The steel can be purchased from a metal supply house. The gravers shown in Figure 1 were made from this steel stock. This steel stock comes in 3-foot lengths and in different size squares. The material is cut into about 4-inch lengths. A 3-foot length will make 9 gravers. When purchased, the surface of the stock is rough with slightly rounded corners; therefore, it must be draw filed or surface ground to smooth the sides and to eliminate the rounded corners. Then the desired shapes of points are filed on one end of each piece.

After this rough shaping, the gravers are hardened. They should be hardened individually in the following manner: Fill a container with water which is about room temperature. The container should be tall enough so the complete graver can be inserted end first into the water and be completely covered with water. Now heat the graver slightly. Then place the graver into a pan of powdered boric acid, rolling it around to get a good uniform coating on its surface. The boric acid coating keeps the surface clean during the hardening process. Now, while holding the graver from its back end with a tong, heat the graver uniformly with the torch. Then, when the graver reaches a uniform medium cherry red color, it is inserted straight down into the water, end first. When the graver is inserted into the water, it should be kept moving in the water to keep bubbles from forming on the surface of the graver. The bubbles prevent the graver from hardening uniformly. The reason for heating the graver uniformly and inserting it straight down end first into the water is to help prevent the graver from warping in the hardening process. After the hardening process has been completed, the graver should be checked with a file to verify if it is hard. If the graver is hard, the file will not bite into the graver but will slide on its surface. The graver should not be tempered until it has been used in order to see if it chips or if the point breaks easily. If the graver is found to need tempering, its surfaces should first be cleaned with fine emery paper. Then some clean sand is placed in a pan and the graver is placed on top of the sand, making sure the graver touches the sand for its full length. The pan of sand is heated until the surface on the graver reaches a very pale straw color. Then the graver is removed from the sand and placed on a piece of glass or metal to let it cool. This tempering should prevent the graver from breaking so easily.

The handles for the gravers can also be made from maple dowel stock which can be purchased from a lumber yard or hobby shop. The length for the graver handle should be 3 to 3½ inches. This will depend on the size of the hand of the watchmaker. If the watchmaker has a large hand, a 3½ inch handle is recommended. The graver should be set into the handle so it extends no more than 2 inches. When a ready-made graver is used, it may be necessary to break off some of the back end in order to have it extend from the handle only 2 inches, or it may be long enough to break in its center and make two gravers out of one. Note: When the graver is being used, the end of the handle should not extend beyond the heel of the hand when the index finger is placed near the end of the graver. This is considered the proper length for graver and handle.

Drilling the hole in the handle for the graver can be done with a drill press or the lathe. If the hole is drilled on the drill press, a holder for the handle can be made out of a piece of 2 x 4 wood. Select a drill the same diameter as the graver handle. Place the drill in the drill chuck. Now place the piece of wood on the drill press table. Drill a hole as deep as possible in the wood without going completely through it. This furnishes a holder for the graver handle which will hold it upright while the hole for the graver is being drilled. The drill used to drill the hole in the handle should be of a diameter which will drill a hole that is slightly larger than the size of the square of the graver but smaller than its diagonal diameter. Before the hole is

Figure 2.



drilled, the center of the end of the handle should be located and a center spotted to guide the end of the drill. When drilling the handle with the lathe, a center should be spotted in each end of the handle. The drill is chucked in the headstock of the lathe and the tailstock center is used in the center of the back end of the handle to keep it centered while the hole is being drilled.

The ferrules for the handles can be made from brass tubing which can be purchased from a hobby shop or metal supply house. Usually the tubing should be smaller than the diameter of the handle. The handle can be chucked in a 3-jaw chuck and supported with the tailstock while it is turned down on its end to fit the brass tubing. The ferrule should be about ¼ inch long. The back end of the handle should be rounded off with a graver. The front end of the handle can be chucked in a 3-jaw chuck and the back end supported with the tailstock while the back end is being rounded. After the handle has been completed and sanded smooth, it should be dipped in shellac so a good coating will be applied to its surface. This prevents the handle from absorbing oil and dirt from the hand when the graver is being used.

To mount the graver into the handle after the hole has been drilled, the graver is held in the bench vise and the handle is tapped onto the graver with a rawhide mallet or fiber-tipped hammer.

Figure 2 shows some of the most used graver point shapes. View A shows the 30° angle graver. This shaped graver is used for general turning and for undercutting for the rivet on a balance staff, as well as for cutting out balance staffs from balance wheels. The 30° graver is used when special shaped points are made on the graver. View B shows the 45° angle graver. This graver is used for general turning and for turning square shoulders. View C shows the right hand shouldering graver. This is a 30° graver which has had its point ground off at an 87° angle, which makes it an excellent graver for cutting square shoulders. This graver allows a square shoulder to be cut without the point digging into the body of the article. View D shows the left hand shouldering graver. This graver is a 30° graver which has had its point ground off at 87° on the opposite side of the point, as the graver in View C. This form makes an excellent graver for cutting behind the hub of a balance staff when the staff is being made. View E shows a graver which has its point ground off square across the end of it. This style point is good for beveling the corner of an article, such as the hairspring shoulder of a balance staff when it is being made. View F shows a 30° graver which has had its point rounded. This style of graver point is used for cutting conical shoulders. This makes an excellent graver for cutting the conical shoulder pivots on balance staffs. View G shows a special graver made from round rod which is good for cutting conical shoulders which are larger than the conical shoulders on balance staffs. These gravers can be made from different sizes of round rods and sloped at different angles to make conical shoulders of different curvatures. View H shows a parting or cut-off graver. This graver is used to cut off a piece of rod in the lathe. It is also used for cutting a groove in a rod and for cutting the groove in a winding stem where the end of the set lever works. This style of graver is also good for removing the material from behind the hub of a balance staff when the staff is being made. Figures 3 and 4 show the application of the special gravers shown in Figure 2. View A in Figure 3 shows the left hand shouldering graver being used to remove the material from the back of the hub of a balance staff. View B shows the right hand shouldering graver being used to cut the seat and shoulder on a balance staff, and View C shows the round end graver being used to cut the conical shouldered pivot on a balance staff. View A in Figure 4 shows the cut-off graver being used to remove the material from the back of the hub of a balance staff, and View B shows the square-pointed graver being used to bevel the corner of the hairspring shoulder of a balance staff.

A very important factor in the performance of a graver is how well it is sharpened. The shape and finish of the graver is of the utmost importance. The face on the graver should be shaped with a suitable angle and should be flat and smooth. The face of the square and lozenge gravers should have a true diamond shape, without having one of the corners of the face higher than the other.

The method used by the old masters for sharpening gravers is the hand method. This method requires much practice and is shown in Figures 5 and 6. Figure 5 shows how the graver is presented to the stone to sharpen the top face of the graver. The graver face is held flat on the surface of the stone and is moved back and forth over the length of the stone until it is flat and at the proper angle. The graver should be moved at different places on the stone as it is being sharpened to avoid wearing the stone unevenly. Note: Some watchmakers prefer to move the graver in a circular motion on the stone to grind its face instead of using the back and forth motion. Both methods are equally as good. Regardless of which method is used, it takes many hours of practice to master. After the face of the graver has been ground, then the two sides of the graver leading to the point are ground flat on the stone as shown in Figure 6. The graver is moved endwise on the stone while it is held flat on the stone.

After the face and sides of the

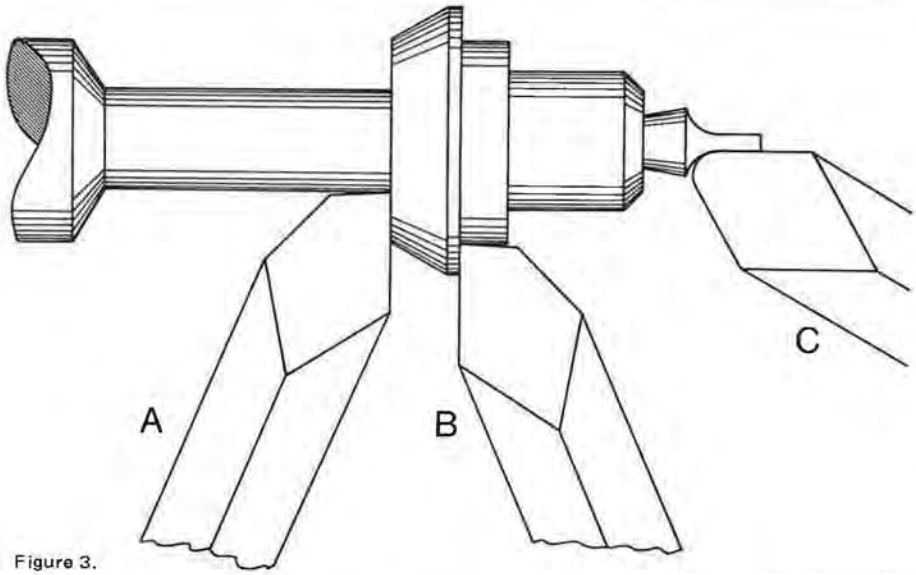


Figure 3.

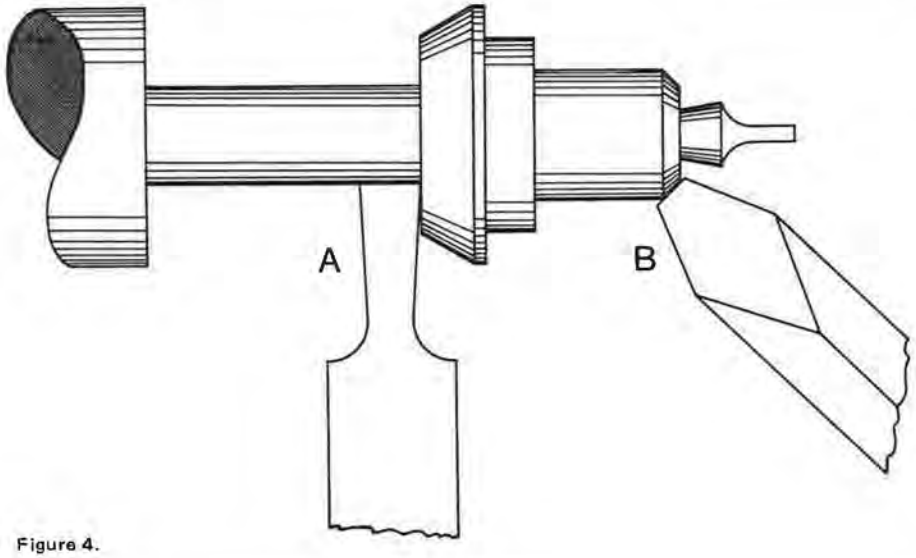


Figure 4.


Figure 5.


Figure 6.

graver have been stoned flat, then the graver is checked for sharpness. Figure 7 shows a good method for checking the sharpness of the graver point. The graver is held in one hand and the point is presented to the thumbnail of the other hand. If the point is sharp, it will stick into the thumbnail. If the graver does not have a sharp point, it will slide off of the thumbnail. The stone being used in Figures 5 and 6 is a combination India stone. One side is coarse and the other side is fine. The coarse side is used for shaping the graver and the fine side is for finishing the graver. The India stone is a manufactured stone. The material is aluminum oxide.

After the graver has been sharpened on the India stone, it is then given a smoother and final finish on the hard Arkansas stone. This is done if the graver is to be used to turn blue steel such as the turning of a stem or balance staff. The hard Arkansas stone is a natural stone called novaculite. This is a hard, close-


Figure 7.

grained stone which gives a very smooth finish to gravers and other tools. The India and Arkansas stones should be kept lubricated with a light machine oil while being used.

For anyone not skilled in sharpening the graver while it is hand held, there are devices on the market for holding the graver while it is being sharpened. One of these devices is shown in Figure 8. This is the Crocker graver sharpener. This device can be set at any angle and has a two axes adjustment. Figure 9 shows the device being used to sharpen a graver on the combination India stone.

Another device for holding the graver while it is being sharpened is shown in Figure 10. This device can easily be made by the watchmaker. It is made from a block of hard wood, such as maple or birch. The device is shown disassembled in Figure 11. A board is needed which is 3-¾ inches wide. A piece is cut off across the grain of the board that is 3-¼ inches wide. Two holes are drilled through the block for the two stove bolts before the block is divided. Drill the holes 1-¾ inches apart and an equal distance from each edge of the board. The diameter of the holes is 3/16 inch to fit the 3/16 inch stove bolts. The stove bolts are


Figure 8.


Figure 9.

(Continued on page 46)

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343	.91	.74	.65	390	1.25	1.04	.93
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Chime and Strike



By Steven G. Conover

Jauch Chime Movement*

Our movement this month is the product of Gebrueder Jauch, KG of Diesslingen, West Germany. The back plate of the movement is stamped "68", which I presume to be the year of manufacture. It is still a current model, which Colonial Manufacturing Co. uses in several wall clocks. Figure 1 shows the Colonial "Sunburst". Colonial lists the movement as their No. 620652, and identifies it as Jauch No. 41-2800/B. I have compared a Jauch catalog page provided by Colonial to our movement, and they appear to be the same.

Figure 1



Before going through disassembly and re-assembly, we will take a quick survey of the movement. It is Westminster chime, with five hammers mounted underneath the movement. The chime train is locking plate controlled. On the same arbor as the locking plate, there is a chime correction cam. The cam is located between the movement plates, rather than behind the locking plate where we are more used to seeing it. The chime lock pin serves a dual role in this movement. It extends both to the front and rear of the locking wheel. The front portion is actually the chime lock pin, and the rearward extension functions as the chime correction pin. Strike and chime trains have a fixed warning run from the locking lever to the warning lever, with the same pin handling warning and locking. Therefore, the warning run does not have to be set as in many other movements. The strike train is the rack and snail type.

Following the examination of the movement for any unusual wear, we are ready to disassemble it. First, let down the three mainsprings. The clicks are located on the rear of the winding arbors, inside the rear plate. Refer to Figures 2, 3, and 4 to identify the parts as we work with them.

On the rear of the movement, there are several parts to be removed. The parts are arranged in a different manner than you may have seen before, and a diagram is necessary for reference. Please use Figure 4. Remove the cover plate (26) and the strike linkage (23). Take out the two idler gears (25). Unscrew the hammer shaft (28), and you will be able to take off the hammers and shaft as a unit. Note that a spacer bushing is on the rear end of the shaft. Remove the chime drive gear (22) after backing off the two set screws. The gear may be tight on the arbor if burrs have been raised by overtightening of the screws. You may have to carefully pry off the gear using two levers to apply equal force on the gear. Polish off the burrs later, unless they are so rough that they might prevent the pivot from going through the hole during disassembly. Note the long spacer bushing for the lower pillar extension, under the cover plate.

The front movement parts can be removed now. Referring to Figure 2, take off the locking plate (5), the black finished levers (2), (3), and (6) behind it, and the rack hook (14). Remove the movement brackets to get them out of your way, and put the upper pillar nuts back on, finger tight. Take off the lower front movement plate, and the barrels. Mark the barrels for later identification. The three clickwheels are identical. They may be difficult to remove from the squared rear sections of the winding arbors. Before removing the upper front movement plate, mark the time second wheel and chime fly for identification. The chime correction lever (18) and the chime warning lever (7) are held in place by split washers between the plates. I suggest leaving these in place during ultrasonic cleaning. Proceed to remove all parts and clean thoroughly.

After any needed bushing work or pivot polishing, plus any other work required in an overhaul, you are ready to assemble the Jauch movement. Refer to Figures 2, 3, and 4. Assemble the arbors and gears into the front plate, leaving the

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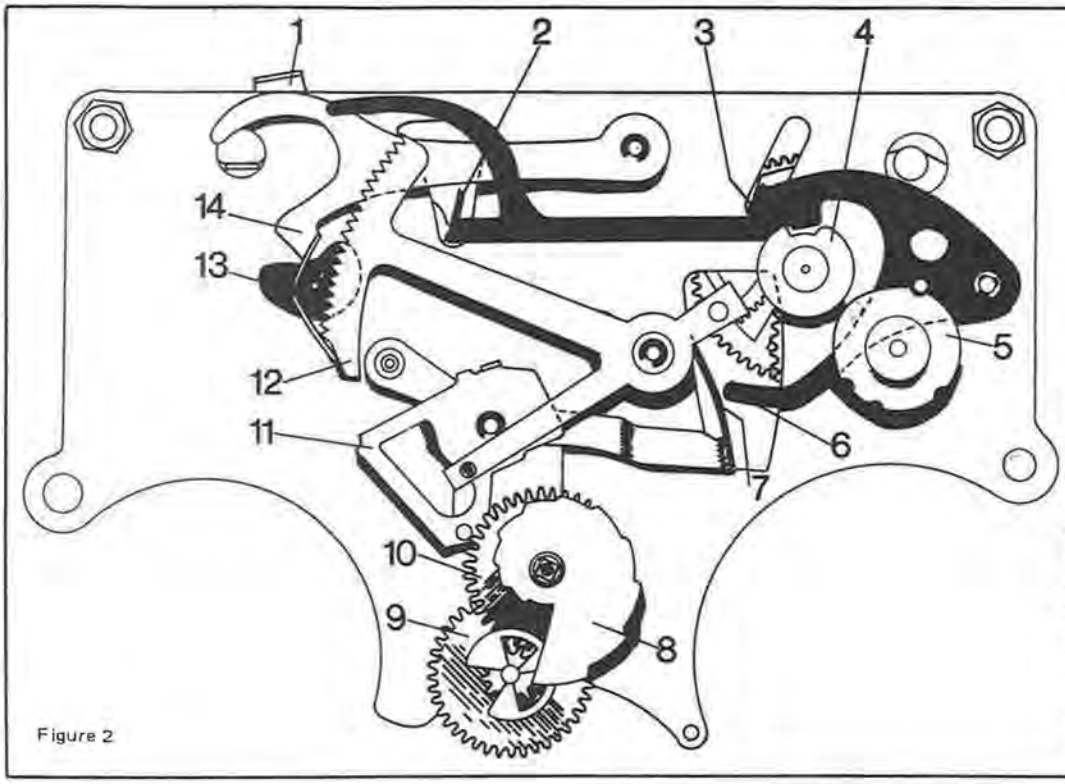


Figure 2

Figure 2 Parts List

1. Strike locking lever (portion)
2. Strike warning lever
3. Chime locking lever
4. Chime cam
5. Locking plate
6. Chime lift lever
7. Chime warning lever
8. Snail
9. Minute wheel
10. Hour wheel
11. Lifting piece
12. Strike rack
13. Gathering pallet
14. Rack hook

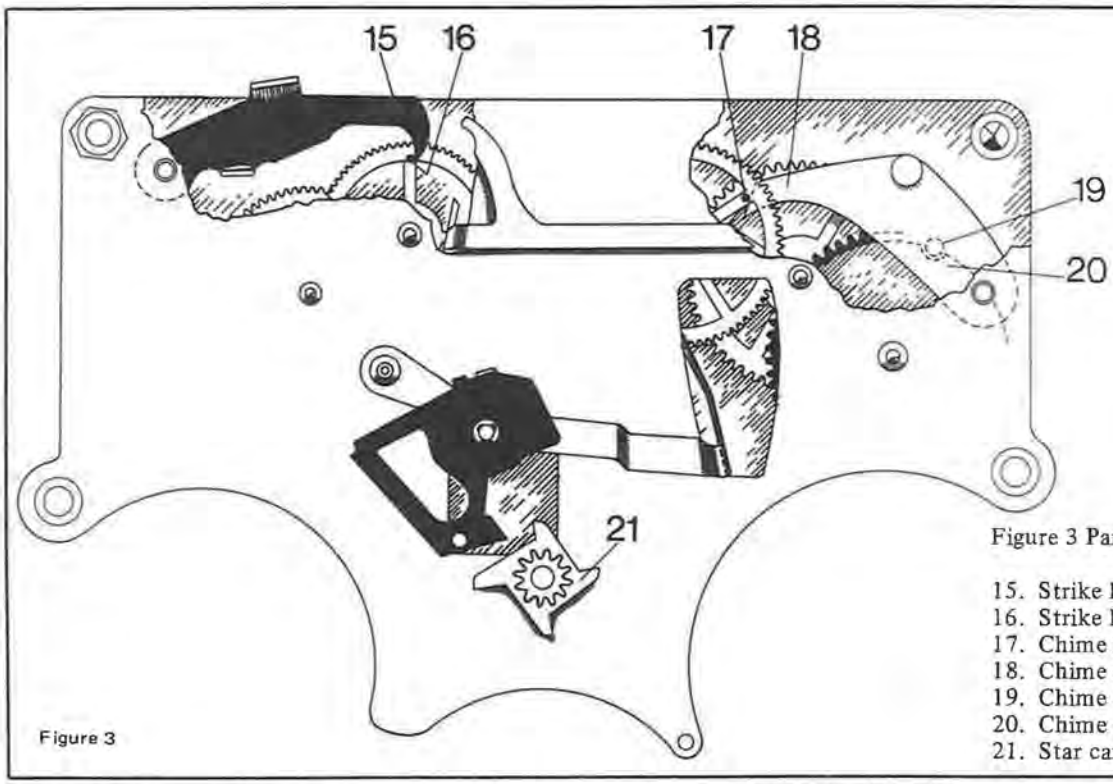


Figure 3

Figure 3 Parts List

15. Strike locking lever
16. Strike lock pin
17. Chime lock pin/Chime correction pin
18. Chime correction lever
19. Chime correction arm
20. Chime correction cam
21. Star cam

barrels and the lower front plate aside for now. The suspension unit and verge should also be put aside. Do not forget to add the strike locking lever (1, 15) which goes between the plates. Watch out for the chime correction arm (19) because it may jam against the chime correction cam (20) as you try to bring the front and rear plates together. This will hold the plates apart, causing you to search about for an "offending" pivot. Never force clock plates together; always locate and correct whatever is keeping them apart.

After the plates are together, do not proceed with all the rest of the front and rear movement parts until strike and chime adjustments have been made. The first step is to adjust the strike train. Add the large part which includes the strike warning lever (2), and also add the rack hook (14). The strike train can be moved by finger pressure now, if you release the rack hook. The fly rotates counterclockwise as viewed from the front. Each time you release the rack hook, the gathering wheel makes one revolution before locking occurs again. Locking should occur as the rack hook reaches the notch in the gathering pallet (13). The strike locking lever (3) stops the strike lock pin (16) at this time. If the fourth and fifth wheels are not synchronized, the locking will happen as the rack hook rides down the slope of the gathering pallet. This causes a shallow lock or even a mis-locking. Note that it is the rack hook, riding the curves of the gathering pallet, which moves the strike locking lever up and down. Separate the movement

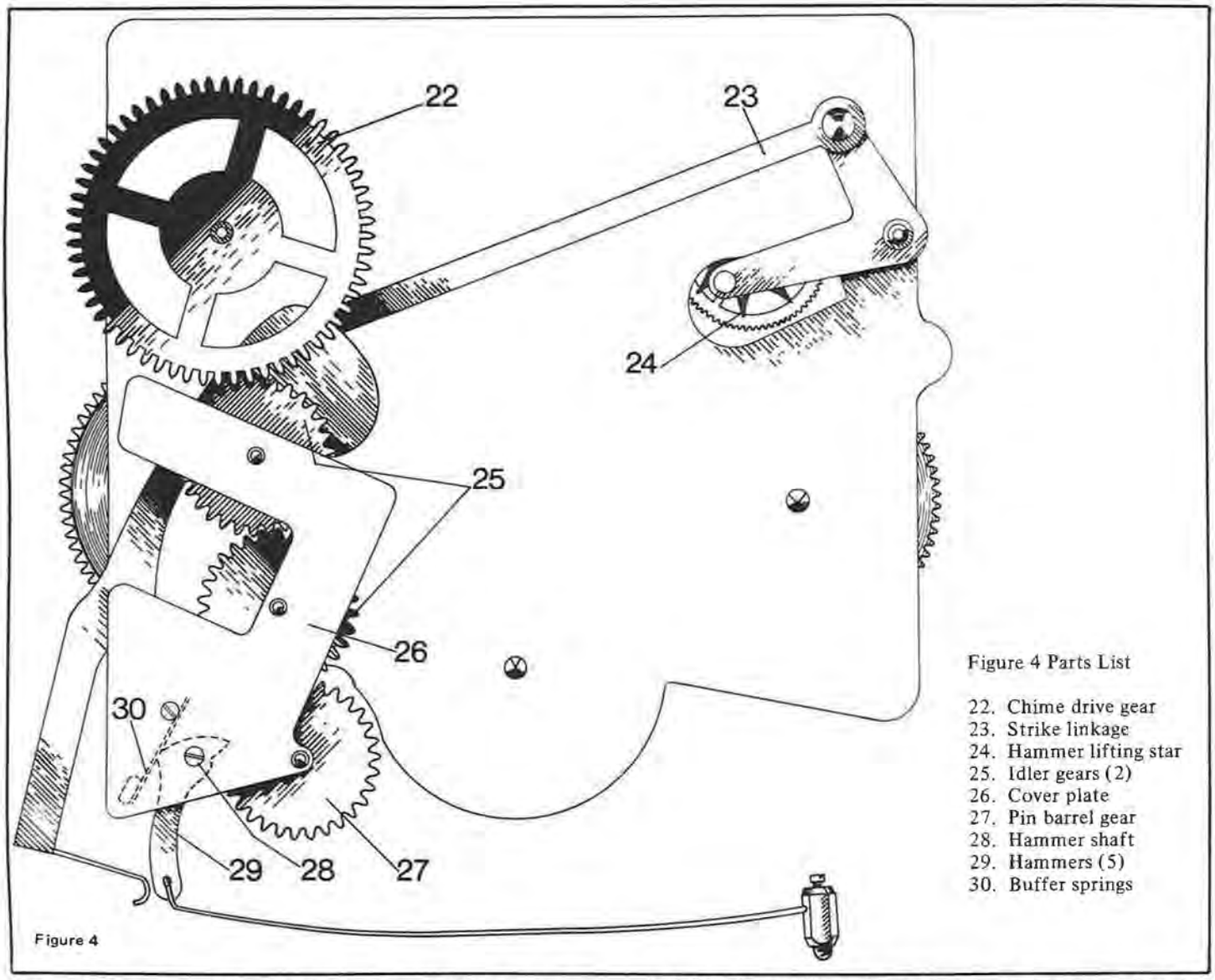


Figure 4

Figure 4 Parts List

22. Chime drive gear
23. Strike linkage
24. Hammer lifting star
25. Idler gears (2)
26. Cover plate
27. Pin barrel gear
28. Hammer shaft
29. Hammers (5)
30. Buffer springs

plates slightly, and synchronize the fourth and fifth wheels as necessary. The pivots are long, so be careful not to bend them.

The next step is to check the strike hammers for an "on the rise" condition. As with any movement, the hammers must be at rest when the strike train is locked. For this adjustment, we need to assemble the strike linkage (23) onto the rear of the movement. The arbor goes through the cover plate (26) which can be put on and held with one nut for adjustment purposes. The other pivot point for the strike linkage is on another arbor which runs between the movement plates. It is held by a split washer on the front movement plate, but we can leave the washer off for now. Since we have not added the strike rack yet, the gear train will proceed through only one hammer blow each time we release the rack hook. This is the action we must observe. If the hammer is free of contact with the hammer lifting star (24) when the strike train locks, then we can be sure the strike hammer will not be "on the rise" at this time. If an adjustment must be made, we are concerned with the strike third and fourth wheels. Separate the plates and synchronize as necessary.

Chime train adjustments are next. The chime cam (4) must be positioned so that when the chime drop lever goes down into the slot in the chime cam, the chime lock pin (17) will be ready to hit the chime locking lever (3) and stop the gear train. The function of the chime cam is to hold the chime locking lever away from the lock pin except at those times when locking is supposed to occur. The most critical time is

(Continued on page 45)

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Questions and Answers/ Henry B. Fried



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

Calculating Driving Weight

Q I have enjoyed your "Questions and Answers" for the past several months. Keep up the good work. I have in my shop an 8-day weight driven striking clock manufactured by the E. N. Welch Co. The clock measures 29¾" by 16¼". There is a label inside the clock that reads "Improved Eight Day Brass clock made and sold by E. N. Welch Mfg., Forestville, Conn." and other information.

I need both weights and the pendulum bob. Can you give me any idea as to the weight of the weights and the bob?

Is there any simple formula to calculate the weight or strength of a mainspring?

Again, keep up the good work. Thank you.

Fred White, CMW
Clinton, Maryland

A *Thanks for the kind words. They are appreciated.*

Now to your questions. The weights I believe should by sufficient if they are each four pounds. A simple effective method of learning the proper weight of a clock's driving requirements and one I have given many times is to hook a small laundry scale to the weight string or pulley and anchor this very securely to a very heavy weight, say about fifteen pounds or to the floor if it is a wall clock. Tense the winding and thus the laundry scale but not so that it lifts the heavy weight off the floor or off the bottom of the clock. In other words, if the heavy weight chosen is 15 pounds, tense the scale until it reads twelve pounds. This then should keep your clock running for a while. It will eventually stop when the laundry scale's spring isn't strong enough to keep the clock running. Where it stops is the least amount of weight that will run the clock and is read directly on the scale. Add a pound to that and you've got it.

As to the formula for a mainspring - That was done in detail in my section in the July issue of Horological Times. Look it up as it is rather lengthy for me to type. If you haven't your July 1982 copy, write headquarters and maybe they can send you a tear sheet or photocopy.

Q I am enclosing information and description of a 6 size yellow hunting case watch, belonging to one of my customers.

The case and movement are in excellent condition. On the back cover is the serial number 44976. The back cover has the design sketched below. The movement is ¾ plate lever set. There is no serial or movement number, and the only name on the movement as well as the dial is Granada.

Any information you can give me on this watch will be greatly appreciated.

E. A. Anderson
Rock Hill, South Carolina



A *I have searched through all my many trade mark references and what I've been able to find is that Derby and Granada were used by the Harmon Watch Co. in the 1942 period.*

Max Greenwold imported the GRENAD watch. I have not been able to observe the peaked cap as a trade mark symbol in any of my foreign or American records of trade marks.

If you could send me a good photo of the movement, both the movement side and under-the-dial side, I may be able to identify the movement and thus, possibly the importer or maker. The fact that your watch is 6s would eliminate the Harmon company of 1942 as maker-importers of the watch. The watch may very well be an American make, but I will need the photos or very accurate sketches to tell for certain. I feel almost certain that I can identify more with these.

Q Please help me identify the watch in the following pictures. Here is a bit more description: It is 19-19¼ ligne and 7j pocket chronograph. The movement is stamped Goering Watch Co. Swiss. It has Harvard on the dial, seconds and 30-minute recorder, and an





(Continued on page 39)

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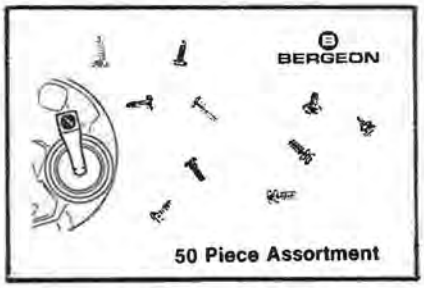
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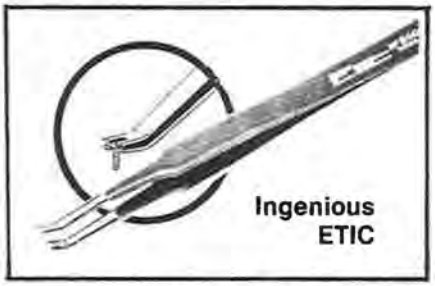
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Book Review

Clock and Watch Escapements by W. J. Gazeley. 294 pages, 192 illustrations, hard covers, and dust jacket. Reprint of the 1956 edition by Van Nostrand Rheinhold at $27.95.

This book has been a standard reference for watch and clockmakers. The late Gazeley, who this reviewer visited while in London some years ago, was known as one of the foremost makers and restorers of timepieces with unusual escapements. He also lectured on this subject at the Northampton College of Advanced Technology.

Gazeley covers both clock and watch escapements in this book. These include the verge, recoil, dead-beat, gravity escapements in clocks, the detent (chronometer) escapements, platform escapements, virgule and duplex, and lever and cylinder escapements. In addition, the tools and equipment are included in the instructional descriptions and manipulations in this manual. Gazeley not only describes the methods of making these escapements, but he shows the special tools needed, how to repair and adjust them, means of polishing and finishing them, as well as their geometrics.

Despite some minor errors in two of the figures (93 and 161) and titles which have not been corrected in this reprint, the illustrations, mostly in black and white isometrics, are excellent. This book still remains one of the best references on this subject.

Henry B. Fried

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THE PICKLE BARREL



By Marshall F. Richmond, CMW

Quality Repairs and Tolerances

Quality repairs in either watch repair or jewelry repair means to repair the article to be as near like it was when new as possible. The term "overhaul" is used commonly for a complete good order watch repair job. Usually a customer, when picking up his watch repair, will look at it and if the case has been polished and the crystal replaced or polished, then remark that it looks like new. But this is just half of a quality repair on a watch. If the watch keeps accurate time for a reasonable time after repairing, the customer will be happy, but the customer will not see any sloppy workmanship left inside the watch, such as fingerprints left on highly polished plates and bridges or a balance that is not running true . . . or many of the other small things that may have been neglected in making the repair. Most customers don't even care, providing the watch performs satisfactorily.

Repair and Restoration.

I believe that in clock repair there is a difference in repair and restoration. Repair is to make the clock run and keep time, but restoration entails much, much more. The clock movement is rebuilt with pivots polished, worn bushings are replaced, bad wheels are repaired or replaced as well as pinions. When the clock movement is repaired like new (many clockmakers actually will put a clock movement in better condition than it was when new), then the case must be restored. This in many cases requires cabinet making skills as well as the skill of refinishing. Some cases have missing pieces that have to be handmade of matching wood, whereas some have to have all the old varnish or whatever removed then refinished with a finish as nearly like the original as possible. Many of the dials have to be refinished to be able to make it look identical to the original when it was new. When this is all done, the clock has been restored to its original new condition.

Clock Repair.

Clock repairing is just repairing the movement, such as replacing a mainspring or cleaning and oiling. Today in many cases the cost of clock restoration is many times what the clock cost when new, but the value of the clock today is many times what it cost new.

Jewelry Repair.

Although jewelry repair methods differ greatly from watch repair, most of each is microscopic work. Repairing jewelry is the same as watch and clock repair in that there are repair jobs and rebuilding or restoration jobs. Whatever the repair is, it should be repaired as nearly to original as possible. If it is a sizing job, I always, by using "V" joints, try and make it as strong as possible. Many trade shops and manufacturing jewelers just use a butt joint which is not going to be as strong as a "V" joint which will not even with the "V" be as strong as if the ring has never been cut.

Next I try and get the shape of the shank where it was sized to look as nearly like the original as possible with no pits from boiling the solder or using dirty flux. If this is an only job and stones are in danger of coming out due to wear or if any other flaw is visible, it is noted on the repair envelope to inform the customer of it. It is really always best to do this when taking the job in for repair, but in doing trade work the workman has no direct contact with the customer and with an only job can do only what was requested. Only jobs that require one or two prongs or tips can never be made to match the other worn prongs because they should be put on as heavy or heavier than when the ring was new. In this way the repair is a good quality repair but only the part repaired as requested is made like new. A person taking in repair, whether watches, clocks or jewelry, should be trained to spot any flaws, worn spots or any part needing repair and sell the custromer on having it all taken care of at once. This gives the craftsman an opportunity to do a complete repair job and guarantee his work. It is also less expensive for the customer. Only jobs should be taken in as a temporary repair and this should be explained to the customer to save a later complaint.

Tolerances

After discussing quality repairs, some explanation should be given regarding tolerances. Tolerance is an allowable variation in dimensions and as I can recall is something that is never really taught in the watchmaking profession. Perfection is all that I have ever heard in repairing watches, which is something we will strive for all our lives and never achieve. In order to make fast enough repairs we have to learn tolerances to be able to determine when we have an escapement close enough that it will not give trouble, end shakes close enough that the pivots will work freely. In escapements a good rule to remember is that they are set up in the factory when the watch is assembled, and unless they have been damaged by rough usage or tampering, they hardly ever need adjusting. But they should be checked on every good order job or when trouble is suspected. Balance pivot tolerance as I was taught was 1/100th of a millimeter in pocket watches, but the Bunn Special Illinois Railroad watch staffs had pivots 11½ hundredths of a millimeter. Hole jewels were a twelve which gave a clearance of one half a millimeter, but if an eleven hundredths millimeter staff was used, the watch would still perform satisfactorily or better with the pivot clearance the same as was used in similar watches. In watch repair, these tolerances cannot be taught but must be learned from experience. In production machine shops the inspector checking hole sizes has two gauges; one is a "go" and the other is a "no go." If the "go" gauge will go into the hole, it is large enough, and if the "no go" gauge will not, it is within tolerance. Although we do not have gauges labeled as such in staffing pocket watches, I have staffs of two or three pivot sizes.

If the larger won't go in the jewel and the next size will, and it leans at a slight angle, I know it to be the correct size.

Tolerances in Jewelry Repair

In jewelry repair we also have to learn tolerance. When we size rings, usually an eighth of a size larger or smaller is acceptable or when we cut a seat for a stone to be set we have graduated sizes in mill burs. Often one is too small and the next one is a little large, but the seat can be cut with the larger and the stone set secure enough to be durable. However, I prefer to use the smaller, and when cutting the seat I exert a little side pressure on the bur while it is rotating which will slightly enlarge the seat and the stone will fit tightly in the seat making a more nearly perfect setting job.

Selection of Settings

Another good example of tolerances is the selection of settings. One particular setting is made in sizes for 1/8 carat, ¼ carat, ½ carat and ¾ carat. The ½ carat setting will easily accommodate a diamond from 3/8 carat to 5/8 carat, which is ¼ carat difference in total size, yet the same setting has this much tolerance. In handcrafting jewelry pieces there is more tolerance than in any repairs, because to make a piece of jewelry it is usually done by a rough sketch, or at best a picture. It is not difficult to make the piece look like the sketch or picture, but when matching a piece that is already made the tolerance greatly lessens for when making a duplication. All measurements have to be close, but there is still a tolerance that will not be visible to the naked eye.

In replacing shanks on rings there is a great tolerance in size of the new shank because after it is installed it can be shaped by filing to the correct dimensions. This saves time in measuring and can quickly be installed, rounded, and then filed. Loss in filings is not very great if you catch all filings and scrap gold which can be sent to a refiner for recycling. As I always send my scrap in and get gold plates and wire in return, I have found that the refining costs are about one third. If I send in 12 ounces of 14K scrap, I usually will get about 8 ounces of 14K stock in return and no money changes hands. Earlier, heads were mentioned as an illustration, but using a miracle type head larger than the original can greatly enhance the appearance of a diamond, making it look larger. But remember to use good judgement in tolerances for it can also make the ring appear out of balance to the naked eye.

In working with jewelry it must be remembered that jewelry is something ornamental, so in making jewelry or repairing it, appearance is probably number one in importance. However, no matter how fine a repair appears to the naked eye, strength and durability are equally important for usually we are working on items of high value. If a large diamond is involved, a weak setting can result in the *loss* of it and can cause complaints and even liability lawsuits. So don't sacrifice strong and durable repairs for looks, but strive to get both.

Even operating a trade shop you have customers and although they are not retail customers they usually are jewelers and each will have his own standards of quality in repairs. One manufacturing jeweler that I know made the statement that he knew his customers well enough that he varied the quality of his repairs to suit them. Those who wanted the highest quality work paid much more for it than the ones who would settle for less. Know your customers whether wholesale or retail and always strive to do the quailty repairs that will please them.

Chain Repairs

Chain repairs have always been a big item in the jewelry repair shop and in making them we have a tolerance so that if we lose a few links in making a repair it is not noticeable. Recently a new product has come on the market that is great for making chain repairs. It is gold solder in powdered form mixed with flux making a paste and packaged in a hypo needle. The chain can be put together and a very small amount of this paste can be put exactly where you want it and with the application of heat a very neat solder joint will make this repair. This is excellent for the very small solid gold chains that have become popular recently. Although this is quite expensive, it saves a lot of time so a chain can be repaired in a maximum of five minutes. One price quotation from a trade shop was to repair 14K chains (one solder joint) $5.00 to retail at $9.95. I would estimate that one hypo of solder (1dwt) costing in the neighborhood of $20.00 will repair at least one hundred chains, giving you $480.00 at wholesale price, or $975.00 at retail price for your work. This solder can be purchased from most material distributors; in fact I have seen it advertised in the *Horological Times*. I have used it and it works well.

Tolerances in Worn Watch Cases

Tolerances in finishing jewelry items or watch cases can vary and must vary with the original quality of the piece being finished. In finishing, however, the main objective is to make the article look like new. Many of the old gold-filled pocket watch cases are worn to the point that the gold is worn off in places. As most of them have a brass base metal if polished well with tripoli and rouge, the brass will polish to blend in with the gold and cannot be noticed with the naked eye. Of course, in a very short period the brass will eventually tarnish, showing up like a sore thumb. There are more ways than one to temporarily overcome this. One is to gold plate the case but the cost of gold plating equipment and maintaining it for no more than a watchmaker would use it is not practical, and even gold plating will wear off in a short period of time. Clear lacquer will make a protective coating but it will also wear away in a short time and will also have a tendency to chip and peel, and it being somewhat difficult to remove also is impractical. The method that I use is to give it a coat of wax (beeswax or auto body paste wax) and then polish it out with a clean cotton buff wheel on the polishing motor at slow speed. Although this is not permanent, it will keep the finish intact for some time. If a pocket watch is worn in a pocket this will keep it shiny. Or, if the watch is put away this will keep it from tarnishing for a long period of time. Wax, unlike lacquer, is easy to remove and can be removed with soap and water. Finishing white gold can be enhanced by the use of Rhodium plating with an electro-plater. If you do enough volume in white metals this could probably pay for itself, but a watchmaker doing maybe one or two days jewelry work each week would hardly find it practical. When jewelry is rhodium-plated, it looks exceptionally well and is hard enough to hold the finish a long time. When it *does* wear through, the next workman will have to remove the remaining rhodium. It is so hard it is quite difficult to polish off. If all gold jewelry is polished first with tripoli and final finished with jewelers rouge, the finish should be of excellent quality. Even though watchmakers and jewelers are in short supply, it is still a competitive field. Customers will still shop the field, so constantly striving to turn out better quality repairs is the only sure way that I know of to keep plenty of work coming in.

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RW42	357	D357	SR44W	7	A, J	1.60
RW44	386	D386	SR43W	6	D, H	1.25
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RW48	393	D393	SR48W	15	F	1.10
RW49	389	D389	SR1130W	17	M	1.10
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RW311	397	D397	SR726SW	26	–	.97
RW313	395	D395	SR926SW	25	–	1.23
RW315	371	–	SR920SW	30	–	1.23
RW320 (WIV)	364	D364	SR620SW	31	T	.95
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RW89-1†	189	–	LR1130	–	–	.75

*This chart is for size reference only; not performance capabilities. Divalent silver-oxide formula gives longer life than any monovalent battery of comparable size.

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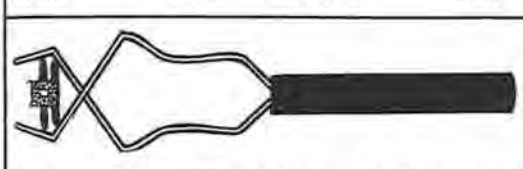
Stock No.	Focal Length	Diameter	Magnification
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51222	1½ in	24 mm	7X
51223	2 in.	24 mm	5X
51224	2½ in.	24 mm	4X
51225	3 in.	24 mm	3.3X
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Repairing a Seth Thomas "Selfwinder"

Part II



By David G. Arnold, CMC, CMBHI

The time train of this movement, which was discussed in Part I in the November issue, differs from the usual spring-driven movement in that the mainspring is on the center shaft. The assembly also contains an electrical contact which is acted upon by a "wiper" contact in the inside of the front plate. It is this switch which turns on the motor and rewinds the mainspring every hour. The rear wheel on the center arbor carries the mainspring barrel, and is wound via an intermediate wheel between it and the motor. The barrel is a snap fit into a groove in the back of the wheel and is prevented from turning in the groove by two pins which extend from inside the barrel through two corresponding holes in the wheel. The barrel is further held on the arbor by a taper pin through a cross hole. To disassemble the barrel remove the taper pin and carefully pry the barrel off the wheel using the slot provided in the barrel. There will be a few turns on the mainspring so keep a grip on the barrel, and let the power down by letting it rotate slowly in your hand. The disassembled mainspring will now appear as in Figure 13. Power from the mainspring is transmitted via the "C"-shaped arbor through another taper pin in the center shaft, to the center wheel of the time train itself. Between the barrel wheel and the center wheel is the wiper switch mechanism. Removal of the taper pin in the arbor will permit disassembly as shown in Figure 14.



Figure 13. Mainspring panel removed from wheel.



Figure 14. Disassembled switch.

As you can see, the switch consists of two arms whose rotation on the wheels is limited by notches on the arms and pins on the wheels. Together they provide one full turn of the mainspring barrel from the time the motor switches on until the arm on the barrel pushes the contact away from the "wiper". In this movement both of the collars that hold the arms in position against the wheel were split so new ones were made (Figure 15). A 0.001" press fit was allowed for after the arbor was polished on all bearing surfaces.

The on-off switch in an electric clock like this one is the part most prone to failure. Any oxidation or contamination will cause problems. It is for this reason that electrical switches incorporate a sliding or impacting action of the contact surface to insure a positive connection. In this movement the wiper arm (Figure 16) is raised by an ivory insulator on the side of the contact (Figure 17) and dropped onto the contact surface (Figure 18). The valley that results from prolonged, repeated operation is visible next to the insulator



Figure 15. New and old switch collars.

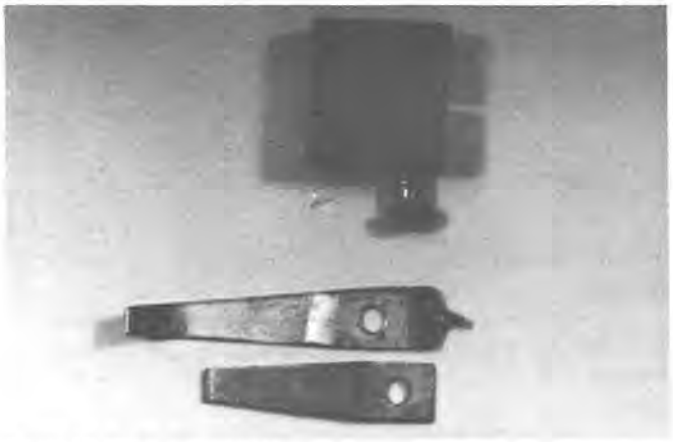


Figure 16. Wiper arm assembly.

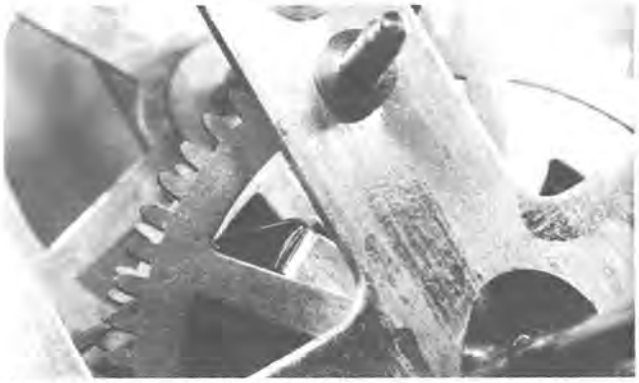


Figure 17. Wiper lifted by ivory insulator.



Figure 18. Wiper dropped on contact.

in Figure 19. I use the same method of repairing these contacts as I did on the brushes. The only difference is that the silver on the wiper arm must wrap over the end of the arm to prevent the steel of the arm itself from wearing out the contact prematurely. Figure 20 shows the repaired contact. Now clean and bush the movement as usual.

When reassembling the switch assembly be sure to allow enough room between the arms and the collars to permit



Figure 19. Ivory insulator and dented contact.



Figure 20. Repaired contact.

them to rotate freely within the limits imposed by the pins. Do not oil the sliding arms as oil here will interfere with the operation of the switch.

Fit a taper pin to be driven by the "C"-shaped center in the mainspring, filling it flush on one side, and no taller than the "C" is thick on the other. The mainspring must be partially wound before the barrel is secured to the barrel wheel. Fortunately the mainspring is very narrow and if the wheel is held between the legs you can easily wind the spring with your two free hands. I have found five full turns to provide ample power for dependable operation. Realign the pins in the holes and press the barrel into the groove in the wheel. Insert a taper pin to hold it all together and the center wheel is assembled. Reassemble the rest of the movement as usual and adjust the escapement.

The height and angle of the wiper contact are important. If the angle of contact with the insulator is too great the lifting action will rob too much power from the train and stop the clock. At rest the position of the wiper arm should be only the thickness of the contact silver below the working surface of the contact. This allows for a solid impact of the wiper on the contact with a minimum of added friction. It also minimizes the wear of the contacts and will insure the clock stopping about the time the contacts need renewing. Once the wiper is adjusted, reattach the motor to the bottom of the movement with the four screws.

Mount the movement in the case and hang the pendulum. Give the mainspring a preliminary winding by connecting 3 volts DC to the connecting post and plate exactly as we did when checking the motor for dead spots. Allow the motor to run for about 15 seconds and disconnect the lead from the plate and attach it to the wiper arm. Give the pendulum a push and put the clock "in beat" and you' re all set.

If the current supply is interrupted it will be necessary to rewind the mainspring again and restart the clock.

With careful adjustment the movement is capable of rates within 2-3 seconds per day because the mainspring is rewound every hour and the power curve of the small section of mainspring used is quite constant. An amazing performance from a 90-year old clock that winds itself!

THE ROCK QUARRY

By Fred S. Burckhardt



Happy Yuletide?

All watch repairmen have "one of those days" every now and then. My problem is that "one of those days" is a good one for me. Major disasters reign on all of the other days.

I had just finished straightening a hairspring on a high grade watch that belonged to a good customer. The only problem was, when I say straight, I mean it was straight, not coiled. To add to the dilemma, it was a rush job, as the customer was leaving town the same afternoon. Somehow, I got the feeling that this wouldn't go over too well with the boss, as I had already broken an escape wheel on one watch and lost a shock spring on still another. All in all, it was still one of my better days.

In a little while, the phone rang. The boss answered it and called over to me to ask if the watch was finished. I told him, "No, not quite." When he asked, "How much longer?" I said, "Probably a few more days. I have to order a new balance."

If there is one thing I cannot stand, it's to see a grown man cry. As he came walking over to my bench, wiping the tears from his eyes, he asked, "Now what happened?"

I explained that I had slipped while I was removing the balance bridge and it dropped off the side of the bench. The only thing wrong was that the balance caught under the center wheel, which ended up making the hairspring about two hundred times longer than it should have been. For some reason he didn't think this was very funny. As he dabbed his eyes with his handkerchief, he asked, "Do you own part interest in the material house? Ever since you came here the material bill has tripled. How come you break so many parts?"

"After all," I said, "Accidents *do* happen, even among the best watchmakers."

"Accidents I can understand," he replied, "but with every watch?"

"Come on now," I said, "it's not with every watch. Remember that one last week? There was no trouble at all."

"Big deal, it only needed a spring bar and you broke three trying to fit one," he said with just a hint of sarcasm.

So I said, "Even baseball players go into a slump once in a while."

"That's true," he answered, "but it doesn't last twenty years. While we're on the subject, have you ever thought about giving up watchmaking and trying baseball?"

I laughed along with him as I learned years ago that you should always laugh when the boss gives out with a little levity.

When he finished laughing, he said, "Please try to be a little more careful. If things keep going the way they are, something is going to have to give. I'm sure you know what I mean!"

For some reason or other, call it intuition if you wish, I sensed just a touch of hostility in his last remark. "I'll show him what a good watchmaker I really am," I thought to myself.

A new record was set. Almost an hour passed with no problems. Now, if I can only go ten minutes more until closing time, I thought, I'll have it made.

All that was left to repair was a ladies' diamond watch and attachment needing a stem and crown, so I thought I'd start on it. The case was tight and while trying to pry it open, the case knife slipped. Two broken links, a bent attachment, one diamond knocked out and a broken crystal! Guess who was walking by when it happened? He stared and had a slight quiver in his lower lip, but he never said a word. I put everything away thinking it wouldn't seem so bad after a good night's sleep.

The next morning, I decided to go in a little early. I thought it would make a good impression. When I rang the bell, there was no response on the buzzer that opened the door. I rang again. Still no answer. I tried looking through the slats of the venetian blinds but someone closed them as I was trying to peer through.

Suddenly the door opened, and all my tools came flying out, landing all over the pavement. Attached to a pair of hairspring tweezers, which appeared to have been bent on purpose, was a note which had two little words written on it: "BUG OFF."

It was at this precise moment I knew for certain that someone inside the store was trying to tell me something. I guess you might say that I have always been quick to catch onto things like this.

When the store opened, I walked inside, went straight to the office and asked the boss, "Does this mean I don't get a Christmas bonus?"

The doctor says I'll be out of the hospital in a few more days. Looks like no Christmas tree or presents again this year!

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- Movement Size: 4 3/16" x 2⅞" x 1½" Shaft Size: 7/16"
- Pendulum: Adjustable from 3 7/16" to 3⅝", to 3⅞", and to 4⅛". Bob diameter, ¾"
- All hands and fittings furnished
- Self-starting and service-free



ALTERNATION MOVEMENTS FOR QUARTZ ALARM CLOCKS

- Movement size 2 3/16" x 2⅜" x ⅝"
- Operates up to 3 years on a single "AA" cell
- Simplified top alarm stop with extended lever for style alarms
- Low current consumption and noiseless operation
- Kienzle transducer system—Bipolar 180° step-angle
- Self-starting and service-free



QUARTZ WESTMINSTER CHIME MOVEMENTS

- Movement size: 5" x 6⅜" x 2½"
- Choice of Westminster, Bim-Bam or Bam strike.
- Night-time volume reduction-volume control
- Front controls—can be mounted to wall.
- Operates on a single "C" cell. (4 "C" cells for chime mechanism.)
- High precision quartz crystal
- Kienzle transducer system. Bi-polar 180° step-angle
- Pendulum length: up to 42½" from center shaft to tip of pendulum
- Self-starting and service-free

SHOP TALK

By Wes Door, CMW



Case Tubes

Case tubes, also known as "pendant tubes," "pendant pipes" or "pendant posts," are generally accepted as being a part of the watch case. This is basically true until or unless it becomes loose, worn, bent, or otherwise does not allow the crown to fit properly, thereby losing its "sealing" effect with the crown gasket.

BENT CASE TUBES–Most bent case tubes may be straightened with round nose pliers placing one jaw inside and one outside, thereby working with the tube wall, or with regular pliers and squeezing on the outside of the tube until straight.

WORN TUBES–Sometimes the case tubes are worn or just appear to be worn due to their diameter being smaller than a standard size crown opening. These odd size tubes generally appear in lower-grade watches and it is impossible to obtain a good fit from a standard crown. If they are worn or undersize, replacement should be made.

LOOSE CASE TUBES–If the case tube is loose, it probably can be tightened by spreading the (inside the case) end of the tube, with "case tube" pliers. See Figure 1.

If these special "case tube pliers" are not available, a round bottom staking set punch may be used to spread the "inside the case" end of the tube, thus "riveting" it. In some cases the case tubes were made to friction press in, and not designed to be "riveted." In these cases, a new case tube should be fitted.

FITTING NEW CASE TUBES–To properly select a new tube to be fitted, we need a case tube assortment. Although large assortments are available, we are showing here a simple eight-bottle assortment in Figure 2. Actually, we are showing only the chart for this kit, not the bottles.

Looking at this chart, we see that "A" is the largest diameter and this remains on the outside of the watch case as this is the shoulder for the crown. We notice that all of the numbers after the "A" say 250. This means that regardless of which case tube we use (from this assortment) it will fit a 2.5 mm crown opening.

As we said, this is a simple assortment, and of course another assortment might have all 2.0mm as an opening, or other kits may have a variety of sizes.

Notice, most all other chart numbers vary. For instance, "B" has choices from 150 to 220 (1.5mm to 2.2mm), and since case openings may vary, this range is good to have. We should select a "B" measurement "case tube" that fits tight and we should either tap it into place (if it is to be friction-set) or tap it into place and rivet the end. See Figure 1.

If we are to rivet the end we must select a "C" measurement long enough for the case tube to extend through the inside of the case far enough to allow a good rivet. It may be desirable to slightly counter-sink the inside of the case to assure a good tight fit.

The "D" measurement is the inside diameter (I.D.) of the case tube and of course the crown's post diameter (post O.D.) must be smaller than this measurement. Any necessary I.D. change may be made after the "case tube" is fitted and tightened in place.

To change this "hole" diameter, a regular set of broaches may be converted to use for this purpose by breaking off the small ends (on a few broaches) to shorten them so they will not "bottom out" against the opposite case wall while using. A set of "case reamers" is more desirable to use as they are already designed shorter.

Although we are discussing reamers to "ream out" to increase hole diameter, these reamers may also be used to remove the old "case tube," especially from Rolex and other screw-down types. Simply tap the reamer into the "case tube" and then use pliers to turn reamer and the "case tube" will be easy to remove. In the case of Rolex, the new case tube may be safely installed by using this method, after which some reaming out may be necessary. By using this method on these "screw-down" types, we never touch a threaded area with pliers. Incidently, on Rolex it is generally desirable to replace the "screw-down" case tube each time the crown is replaced.

We think of crowns, crystals, and gaskets as needing a good tight fit, and in this group we should include case tubes. If there is any question about tightness, Aron Alpha®, Loctite®, or equivalent could be added to the inside between case and case tube. A tight fitting case tube *is a must.*

Figure 1.

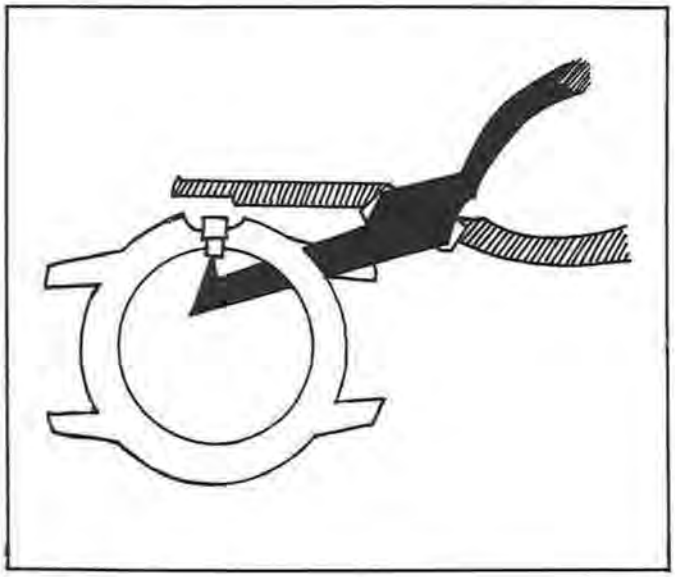
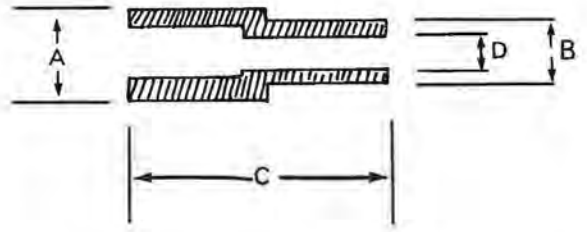


Figure 2.



A	250	250	250	250	250	250	250	250
B	150	180	190	195	200	200	200	220
C	200	440	330	290	290	350	410	370
D	120	135	150	150	160	155	150	175

Swiss Quality Watch Movements

New Mechanical Movements



AS 1977-2 (Replaces AS 1012) **FF 59-21** **FHF 69N** (Replaces FF 60)

Quantity	Caliber	Size	Features	Cost
	AS 976	5x7	17 Jwl Incabloc	42.00
	FF 59-21	3¾x10	17 Jwl Incabloc	25.00
	AS 1977-5	5½x6¾	17 Jwl Incabloc	22.50
	ETA 2442	6L Round	17 Jwl Incabloc	46.00
	ETA 2412	6¾L Round	17 Jwl Incabloc	27.00
	FHF 69N	6¾x8	17 Jwl Incabloc	16.00
	ETA 2512-1	7¾L Round	17 Jwl Incabloc	26.00
	FHF 371	8¾L Round	17 Jwl Incabloc	18.95

New Quartz Movements



Qty.	Caliber	Size	Features	Cost
	ESA 963-121	11½L	DSS Day Date	18.00
	ESA 960.111	11½L Round	Date Quartz Analog	26.00
	ESA 536.121	11½L	Day Date	22.00
	ESA 924.001	5½x6¾	Quartz Analog	18.00

Quartz Replacements For Mechanicals

ESA 977.001—Quartz Replacement for AS 1977-5—Uses Same Hands—Case $25.00.

ESA 961.001—Quartz Replacement for FF 60—(Dial Feet Must Be Shortened) $18.00.

ESA 102.001—Quartz Replacement for FF 59-21—Same Dimensions and Dial Feet $30.00.

ESA 950.001—Quartz Replacement for ETA 2512—Same Dimensions. Dial Feet must be changed $38.00.

ESA 301.001—Quartz Replacement for AS 1012-1677 Bulova 5AH—Same Dimensions & Dial Feet $18.00.

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Residence Courses in Clock Repair for '83

The First to be Held January 24 Through 28

The increased interest in clock-repairing has prompted AWI to schedule four comprehensive courses for 1983. The "Introduction to Clock Repair Course" was first given in Cincinnati, Ohio last June. Because of the success of this first presentation, we have scheduled it to be held twice in 1983. The first class will be January 24 through 28, 1983 and the second will be held June 6 through 10, 1983. Otto Benesh and Marvin Whitney are the instructors for "Introduction to Clock Repair."

Another course, "Introduction to Striking Clocks," was presented a number of times during this past year as a two-day program. Dr. Joseph Baier has expanded the scope and curriculum for this course; it will now be presented twice in 1983 as an "advanced" course in clock repair. The dates scheduled for this course are April 11 through 14, 1983, and October 17 through 20, 1983.

Complete details of each course can be had by contacting AWI Central for a brochure. Since time is rather short to register for the "Introduction" class to be held in January, I will devote my column space to the details of this course; details of the "advanced" course will be given in next month's issue of *Horological Times*. The course will cover: use and selection of tools, nomenclature, escapements, trains, pendulums and suspensions, disassembly, cleaning, lubrication and assembly.

Participants will learn the following repair procedures: bushing, repair and replacement of pivots, repair of wheels (gears) and pinions, repair and checking pallets, broken hands, motion, weights, and mainsprings. The striking train will be disassembled, repaired, adjusted, and reassembled. Nomenclature and function of parts will also be covered.

THE COURSE OUTLINE

I. Proper use of references
II. Tools
  A. Selection and proper use of tools
  B. Care of tools
  C. Safety precautions
  D. Alteration for specific jobs
III. The clock
  A. The clock that we will use in the course is divided into two sides.
    1. The time side
    2. The strike side
  B. The time side is divided into four groups
    1. Power group
    2. Transmission group
    3. Motion group
    4. Control group
  C. The strike side is divided into four groups
    1. Power group
    2. Transmission group
    3. Control group
    4. Sound group
  D. Each of these groups is further subdivided, and they will be named and discussed during the actual examination, repair, and adjustments to the clock.
IV. Disassembling the clock
V. Examining and repairing the time side
  A. The power group
    1. Weight driven
    2. Spring driven
  B. The transmission group
    1. Wheels and pinions
    2. Pivots and pivot holes
  C. The motion group
    1. Hour wheel and minute wheel
    2. Cannon pinion and cannon friction spring
    3. Hands, hand collet, hand nut
  D. The control group
    1. Pallet arbor and pallets
    2. Pallet fork
    3. Pallet arm
    4. Pendulum suspension spring and rod
    5. Pendulum slide
    6. Pendulum bob, rating screw, and nut
VI. Examining and repairing the strike side
  A. The power group
    1. Weight driven
    2. Spring driven
  B. The transmission group
    1. Great wheel
    2. Second or intermediate wheel
    3. Locking wheel
    4. Third or warning wheel
  C. The control group
    1. Strike lifting cam
    2. Strike actuating lever
    3. Warning stop lever
    4. Count hook lifting lever
    5. Stop lever
    6. Count hook
    7. Count wheel
    8. Locking cam
    9. Warning pin
    10. Fly
  D. The sound group
    1. Bell or gong
    2. Hammer head
    3. Hammer spring
    4. Hammer tail
    5. The hammer
    6. Strike cam
    7. Strike actuating pins
VII. Cleaning
  A. Types of solutions and rinses—safety precautions
  B. Methods of cleaning—hand, machine, ultrasonic, use of pegwood
  C. Methods of drying
  D. Cleaning the mainspring
  E. Removing rust, arbors, and pinions
  F. Polishing
VIII. Assembling the time train
  A. Mainspring and/or barrel unit-replacing cap
  B. Replacement of train
IX. Assembling the strike train
X. Lubrication

JOBS OR REPAIRS TO BE COVERED IN THE COURSE

Filing or reshaping a tapered pin
Polishing pivots and pinions
Replacing a bushing
Replacing latern pinion trundles or rods
Replacing lever arms in American shelf clock
Replacing pin/pins in pin wheel
Replacing suspension spring
Replacing tension spring on fly
Replacing tooth/teeth in wheel and barrel
Replacing wire tension springs on American clocks
Repairing a broken hand
Repairing click spring on American clock
Repairing the hole end of a mainspring
Repairing friction tension collet on center arbor of American clocks
Repairing and/or making a click
Squaring and dressing up barrel arbor squares
Straightening an arbor
Straightening an escape wheel tooth/teeth
Straightening pivots
Topping escape wheel teeth

Other projects will include making the following:

Brass lined pliers and/or tweezers
Brass bench block
Brass and steel hollow and/or solid punches
Gong rod bending tools
Screw bluing tool or holder
Taper pins removing pliers
Hand lifters

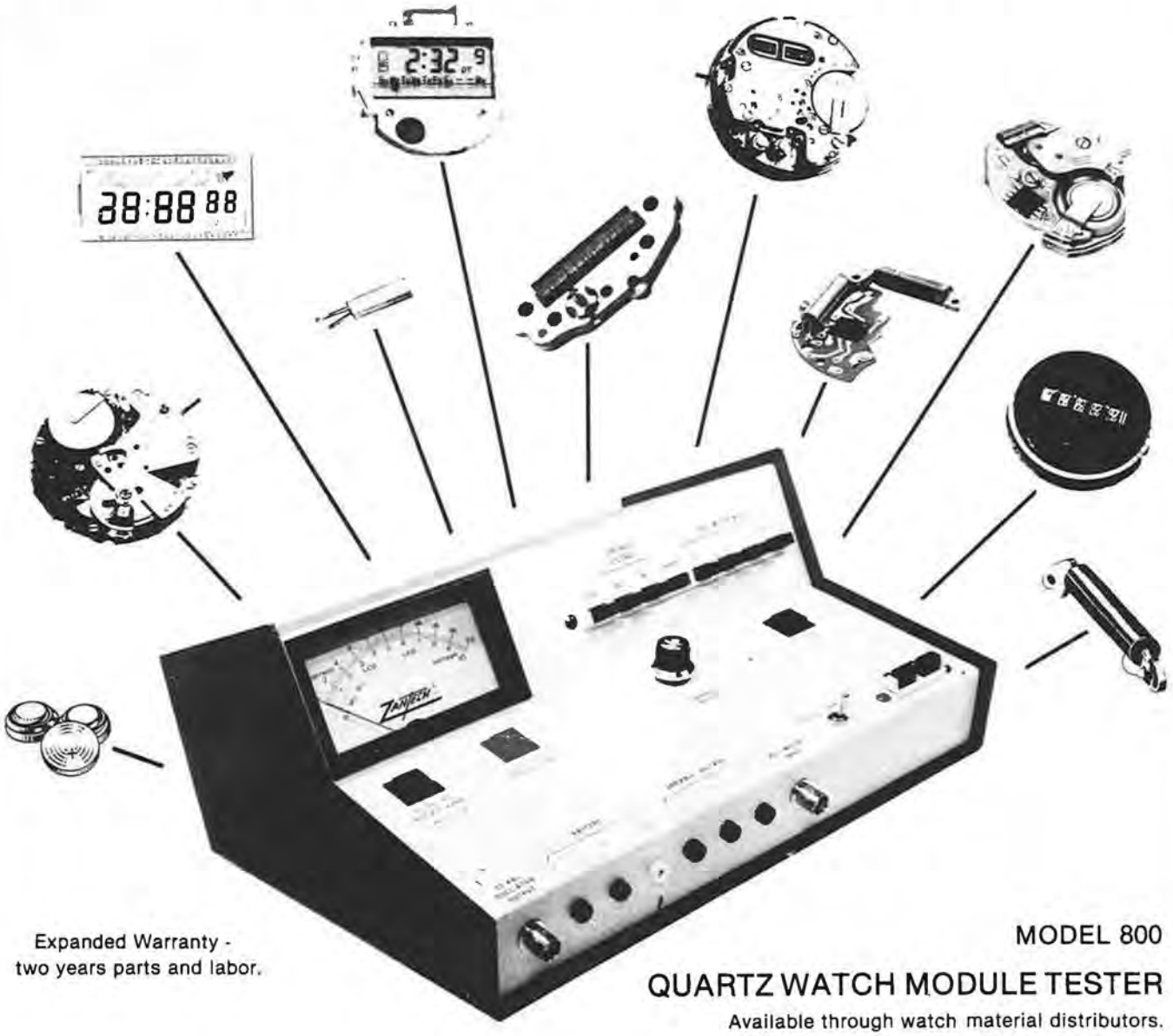
TOOLS

A complete tool brochure including pictures of the recommended types of tools has been prepared and will be provided by AWI Central.

AWI will furnish the raw materials, cleaning solutions and equipment, movements, lathes and collets, instruction, and facility. The course will be held at the Imperial House West, located at Rybolt Road and I-74, Cincinnati, Ohio—just minutes from AWI Central. Enrollment is limited. The cost is $325 for AWI members, $425 for nonmembers.

The instructors may make any minor changes in the curriculum as they see fit.

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by Orville R. Hagans

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Mystery Follows Watch From Creation To Theft

Of special interest to art collectors, not to mention Sherlock Holmes fans, is the disappearance from the Nordic Museum in Stockholm of a unique and very valuable watch which belonged to King Charles XII of Sweden. This theft may well be linked to a series of buglaries committed at about twenty museums all over Sweden.



The watch of King Charles XII of Sweden.

As clever as the thievery itself is the story of this watch. Believed to have been crafted by an ingenious French immigrant named J. Bellette working somewhere outside London in 1700, the watch is without hands, having instead two openings in the dial, underneath which rotating dials with hours and minutes are located. These are concealed by two blued and gilt plates with the inscriptions Bellette and London.

To see the dials it is necessary to press down the stud through which the suspension ring passes, thereby forcing the plates clear to reveal the time. Watchmakers, unless they are especially given to the novel, have little to say about the watch's purpose.

What aids historians in dating a watch such as this one is a 1700-1701 London hallmark on its gold case. If the inside of this watch is unique, the outer gold case as well shows design of a highly accomplished craftsman. On one side is the cypher of the "Warrior King" surmounted by a crown, while delicately enamelled in the center of the opposite side are the arms of Sweden surrounded by the coats of arms of all Swedish provinces during Charles' reign. "Carolus Duodecimus Vivat Floreat Triumphat" is inscribed around the edge. With the watch is fashioned a double key and a short chain of three rock-crystals, as well as a cameo separated by the cyphers of the King and his two sisters, Princesses Ulrica Eleonora and Sophia.

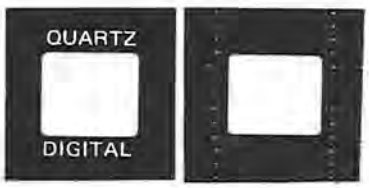
Swedish officials, though investigations continue, hold very little hope that the museum piece will ever be recovered.

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DELIZ, Rafael A. Chaves—El Paso, TX
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YAGER, James—North Olmsted, OH

QUESTIONS AND ANSWERS
(Continued from page 22)

alloy over coil balance spring. There is no balance wheel, roller or staff, no factory I.D. marks, and there is no evidence of marks having been removed.

Any help or suggestions will be greatly appreciated.

Keith Brouzes
Modesto, California

A *The Harvard name as well as the Goering labels were the property of B. P. M. (Bayer Pretzfelder & Mills, Inc. of 37 Maiden Lane in New York City). This is in the 1930 era and just a bit later until the B. P. M. concern went out of business.*

They were the agents for the Buren ligne of watches. They had many trade names for their watches. Of course, your chronograph is no longer made. My thinking was that it wasn't ever imported into this country, especially with the name Goering during the hostilities of WW II coming up soon and propoganda against anything German was growing. This is reinforced by the fact that there is no initial symbol on the balance bridge as then required by U. S. Customs law, such as UWA, CDF, assigned to every U. S. importer for importer designation and identification.

As far as I can make out this was an old Lemania model, no longer made or imported, nor are materials for this available. The set parts or the chronograph configuration aren't shown in any U. S. catalogue. I have even searched through my German (Flume') material catalogues and while they show numerous pocket chronograph movements, none exactly like yours.

I wish I could help further, but I did spend much time trying.

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Experience

In response to a letter I recently received, I feel this article should be devoted to experience.

Our watchmaking schools are doing the best they can to give a complete education to their graduating students. However, it is important to remember that a school cannot teach *everything* watchmakers will encounter when they enter the "real" world. Bench time or experience is still required to put the polishing touches on the graduates in order to make them well-rounded watchmakers.

In this particular letter I received, it was pointed out that a graduate student from one of our schools was having difficulty in securing a job because he lacked experience. Reasons for this were the following:

1. There was no watchmaker employed by the store to assist this young watchmaker.
2. Shops interested in *productivity only*, and not interested in hiring someone, considered him a beginner.
3. The prospective employer lacked the time to spend helping a graduate.

In many cases, a store without a watchmaker that has a need for one lost their previous watchmaker through retirement or other reasons. In the case of retirement, why can't the retired watchmaker spend a little time helping the apprentice?—I'm sure someone helped him get *his* start.

As far as productivity, let's face it: one must crawl before one can walk...and walk before run. In a quality repair shop, the concern should be with quality work. Eventual speed comes through *experience*.

In the case of lack of time, if there is a need for a watchmaker, I'm sure time can be made available to help the beginner.

The problems of our new watchmakers receiving a position as respectable watchmakers are evident. Something has to be done about these problems.

After graduation from a watchmaking school, what can the new watchmaker do to help himself in these areas? There are many very fine watchmaking guild members who are willing to work with each other, and a program director who is not idle.

For instance, at one of our meetings it was suggested that each watchmaker offer one or more bench tips that they had found aided them in repairing watches. This kind of information I'm sure aids everyone. Along with this, there are several bench courses offered on weekends. The watch manufacturers offer courses along with the AWI.

If you join a guild and present some of your problems I'm sure there would be someone who would be more than willing to help. If you attend the bench courses offered, not only will you be keeping up with the times, but you will also show your employer you are concerned about your profession, and are eager to put forth the effort to be a true quality craftsman.

As the holiday season approaches when I know everyone is working extra hours and becoming slightly tired, I would like to wish everyone a Merry Christmas and a very happy, prosperous New Year!!

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We Salute These Museum Donors!

(Listed in Alphabetical Order)

The AWI ELM Charitable Trust wishes to acknowledge receipt of the following donations. The items will be added to the collection in the AWI Museum in Cincinnati, Ohio to perpetuate the history of horological progress.

BAIER, JOSEPH G., Ph. D.; PHOENIX, AZ: Old Archimedian hand drill, brass and steel. Arrowhead drills, complete set in original round wood holder. Uprighting tool for setting up escapements in full plate watches. Hardinge Bros., Chicago, Illinois. Circa: 1900. K & D Co. Mainspring winder No. 128, complete with misc. accessories in orig. box. Small bench drill press assembled from misc. tools for an unknown special job.

BAIER, MRS. THELMA PEACHER; PHOENIX, AZ: Given in memory of Warren Hampton Peacher (1892 - 1978). Drill press vise. Mounted by Warren Hampton Peacher, a journeyman mechanic, salesman, foundry president, who in his retirement developed a foundry for the manufacture of marine hardware.

ELGIN & WALTHAM WATCH CO's.; CHICAGO, ILL: Balance screw weighing machine designed and built by Elgin in 1919 to weigh and sort watch screws. One of U. S. industry's earliest examples of automation equipment.

FOREMAN, JAY, JR.; LOS ANGELES, CA: Series of 12 Omega watch movements produced between 1950 and 1970 mounted on a handmade wood display stand designed and made by donor.

HAGANS, ORVILLE R.; DENVER, CO: Hermle 400 Day Clock with moon phase, small, Model 80/211. Hermle Model 141/080 8-day spring-wound movement, 2 bell ting-tang strike, self-beat adjustment, pendulum, hands (no dial or case) mounted on walnut board with brass color wall bracket. Display mounting made by donor. Hermle Model 451/030 Westminster movement, solid dead beat escapement, pendulum, weights, hands and chime rods, (no dial or case) mounted on handmade oak back board. Display back board made by Hermle Black Forest Clock Co., Amherst, VA. Mark I Boat Clock, U. S. Navy, #3858, 1941. S. T. movt. # 5184. Black dial, luminous hr. markers and hands, subsidiary secs. dial. Boat clock movement only, S. T. #5186, ca. 1941. Chelsea Clock Co. movement only, round plates. Man's plastic wrist watch made by Tissot (Swiss) of DELRYN plastic. Plastic wheels & pinions, esc. wheel, pallets, fork & guard finger. Pivots imbedded in plate, fitting into holes in wheels' arbors. Case & dial all plastic (acetone solvent). Balance "jewels" are made of plastic bearing. Handmade silver "Sundial" wrist watch, plastic ribbon band. Presented to O. R. Hagans by Ohio Watchmakers Assoc., annual convention, Columbus, Ohio, July 27-29, 1973. Self-beat adjustment patented by Hermle Clock Co., Gosheim/Wttgb., Germany. Plastic display stand by donor. Single chime & strike train wheel patented by Globe & Franklin Clock Co., Philadelphia, PA. Plastic display stand by donor. Tailstock jeweling tool mounted on walnut finished wood display base by donor.

HAMILTON, G. ROBERT: G. E. Astronomic Time Switch, Model # 3T18S0, #4127489(A) with label "City of New York, No. 11269." Time switch for mounting on light pole to turn street lights on and off.

HARRIS, ADDISON H.; CENTERVILLE, IN: Lot of 6 American & Swiss watches. New England Watch Co., 10s, model "Hale", g.f. o/f case, fancy gold dial, sunk secs., black numerals. Illinois Watch Co., 10s h/c movt., # 890254, ca. 1888, 15j, made for C. G. Schlenker, Eaton, Ohio. White dial, "Old Reliable", sunk secs., black & red numerals, black hands. Engraved g.f. o/f octagon case. Elgin Natl. Watch Co., 18s h/c movt., # 3605419, ca. 1889. Stem wind, lever set, 7j. White dial, sunk secs., black numerals & hands. Fahys s/r o/f coin silver case #B3755. New Haven Watch Co., movt. # 883218, ca. 1883-86, key w/s. O/f silveroid case #1328919. Key with watch. Ohio Watch Co., fictitious American company name on movt. & dial. 18s Swiss movt. #952406, 15j, key w/s. Nickel s/r o/f case, Silverus, Registered. Swiss watch, 19 lignes, 15j, key w/s. White dial, subsidiary secs. dial, black hands & Roman numerals. Engraved silver hunting case, # 87198. Illinois "Spartan" o/f nickel case, # 583892. Columbus Watch Co., 18s h/c movt., # 79652, ca. 1883, 15j, stem w/s. White dial, sunk secs., black hands & Roman numerals. Swiss movt., 19 lignes, 15j, key w/s. White dial, Roman numerals. No hands. American Waltham Watch Co., 12s, o/f movt., # 14694642, "Colonial" series, stem w/s. White dial, red & black numerals, sunk secs. Ca. 1906. Seth Thomas Watch Co., "Centennial" o/f movt., #3263716, ca. 1913, 6s, 7j. Dayton Watch Co., fictitious American company name on movt. & dial. 15½ lignes Swiss h/c movt., No. 431267, 7j. White dial, black Roman numerals, subsidiary secs. dial. Misc. lathe attacnments & tools, index latch.

HERMAN, HAROLD J.; CINCINNATI, OH: First Ultrasonic generator and tank, vacuum tube driven. Beede Electrical Inst. Co., Inc., Penacook, NH. Late 1950's.

HICKMAN, MR. & MRS. EARL; CAMBRIDGE CITY, IN: Electric clock made by Gibraltar Electric Clock Co., Inc., Jersey City, NJ, ca. 1933. Silver finish dial with sweep seconds. Metal ship's wheel case on base with Roosevelt figure on side. Embossed motto, "Roosevelt At The Wheel For A New Deal".

JANSEN, LAWRENCE E.; DENVER, CO: Man's Hamilton electric wrist watch. Model: "Ventura". "500" movement. Silver dial, gold numerals and hands. 10K g.f. case, #S185026. Speidel calendar band, 10K g.f. top caps on ss back.

JONES, JOHN; DENVER CO: Westclox pocket watch, 16s, silver color dial with off-white chapter ring, subsidiary secs. dial, black hands and numerals. White metal case. Stamped on movt. -DAX-, 12-8-37. Hair chain with 1/20K g.f. ends and center ornament.

KIROUAC, E. J., CMW; GARDNER, MA: Archimedean drill, brass, mounted for use in bench vise. Swiss made, ca. 1860.

LOWEN, FRANK M.; SAN DIEGO, CA: English watch, Victor Kullberg, 205 Liverpool Rd., London and Maker to the Admiralty with anchor insignia engraved on movement. Kullberg, London, 6899 on dial. 18 Lignes, gold plates, fusee, bal. bridge anchored at two ends, dia. cap jewel, key & stem wind, key set. Porc. sunk dial, center secs. hand, up & down indicator. 18K open face gold case, crown and bow. London hallmarks date case 1866-67.

MARTIN, ESMOND B.; OLD WESTBURY, NY: Breguet watch No. 3198 accompanied by a Breguet authenticating certificate No. 3433, original date of sale Sept. 21, 1858. Gold open face quarter repeating watch, 22 ruby jewels, gilt lever movt., stem wind & pin set, bi-metallic compensation balance, overcoil balance spring, wolf tooth winding wheels, one white capped wheel bridge. Gold cuvette, silver engine-turned dial with polished chapter ring, black enamel numerals, subsidiary secs. dial, blued steel moon shaped hands. Engine-turned case, number 4622, signed Breguet No. 3198 on cuvette and on dial.

MINGES, WILLIAM; CINCINNATI, OH: First Longines Quartz reed analog wrist watch, calendar, movt. # 51417781. SS case #228892 with "Duchess" SS band.

PEASE, HAMILTON E.; PROVIDENCE, RI: Lady Hamilton watch movt., grade 911, T25-5047, ca. 1938-39. 17j, G21. Silver dial, black hands and numerals. Elgin Natl. Watch Co., convertible movt. #700928, grade 85, model # 2, 16s, 15j. White dial, black hands and numerals, sunk secs. dial. Ca. 1880.

TO BE CONTINUED IN NEXT MONTH'S ISSUE.

Affiliate Chapter Column / Robert Allis



A Good Motto: BE PREPARED

A few weeks ago I happened to read an article in the local newspaper which I would like to pass on to you. Dateline: Biel, Switzerland. "Thousands of Swiss workers in this watchmaking capital rallied Saturday to protest the spread of unemployment in what was once Switzerland's flagship industry. Speakers called for increased aid by Swiss Commercial banks that already have propped up the ailing industry with a credit to the largest concern, SSIH, equivalent to $170 million last year."

The article goes on to say that they want the government to retrain the jobless. It seems that Switzerland's share of the world market has shrunk from 45 percent in 1970 to a mere 9 percent last year. Quite a drop, isn't it? And here we thought *we* had it bad.

There is, however, a footnote to this: The unemployment in Switzerland has gone from 0.2 to 0.4 percent in the last 12 months, the lowest in the industrialized west.

I realize this has nothing to do with us in the United States, but it does give us a little insight into what is happening in the watchmaking industry and perhaps preparing us for what is to come in the future.

Leading economists are predicting that this recession is coming to an end. I seem to have heard that one before, only it went something like this: Prosperity is just around the corner. The only problem is that it took 10 years to find that corner. For those of you who do not recognize it, this was the saying of the great depression. Regardless of when, the fact remains that sooner or later this recession will come to a close and, when it does, I predict a great boom. People have been going too long without buying the things they would really like to have, and human nature being what it is, when the money becomes available, they are going to start buying all those things they have been doing without. So be ready for it.

I doubt that the watch repair industry will ever come back to where it was a few years ago because there are going to be increasingly fewer mechanical watches on the market. Those persons who do have good tick-tock watches will want them kept in good working order, and the electronic timepiece is going to require servicing, so the watchmaker who can do both is the one who is going to get the biggest slice of the repair apple. I don't know how many of you were boy scouts in your youth, but their motto seems to be very appropriate in this case: "Be prepared." Don't be surprised. It is amazing what a little training can do. Any watchmaker worth his salt can easily learn to repair any of the electronic timepieces on today's market. If you are not as yet repairing these electronic marvels, I suggest you get in touch with your local or state associaion and ascertain when they are having their next bench seminar, or ask AWI when they have one scheduled in your area. And don't give me that malarkey about being too old. Several years ago when I took the CAT course, we had a man of 72 in the class. He not only passed the exams, but he had the highest grades, so get with it.

By the time you read this, you will probably be into your 26 hour days. At least most of you will be putting in many extra hours. It would be nice if we could spread out our work in an even fashion, but in all the years that I have been at the bench, it has either been feast or famine. One week you don't know how you can ever get caught up, and then you are looking at the bottom of the box. However, for anyone working in a retail establishment at this time of year, it becomes practically a nightmare. Fortunately, it is over rather quickly and we can then spend the holidays with our families in the manner for which this season was intended. If only there were some way we could carry the spirit of Christmas throughout the year. I think it is best expressed in the lyrics of a record which I have: "The true meaning of Christmas is the giving of love every day." I guess what I am trying to say in a roundabout way is Merry Christmas, and may the Good Lord bless and keep each and every one of you!

RA

...from all around the ASSOCIATION...

INDIANA

The Watchmakers Association of Indiana held their 1982 Convention recently. It started off with Mr. Henry Frystak of the Bulova Watch Company, who presented a trouble shooting eight-hour bench course of the Bulova Watch Company quartz analog movements. More than 35 students attended Henry's workshop.

Later in the Convention, Mr. Gerald Mauch, C.P.A. gave a talk on the need of an accountant in this day and age. Maurice Williamson, from Purdue University, was the after-luncheon guest speaker, followed by WAI awards and door prizes, and president Jim Adams closed the convention with a talk about happenings from all over the state, technical information, and meetings.

Also recently at the Airport Hilton Inn, the Ball Co. and Citizen Co. of Chicago, Illinois presented to Hoosier Watchmakers the Citizen Watch Co. bench course on the theory and servicing of the Citizen Analog quartz watch. Gene Kelton was the instructor, assisted by Mr. Kazuo Urata, conducting the "hands on" class. Mr. Kelton had some exquisite movie films shot at the Citizen factories depicting the fabrication of the quartz movements. There were more than forty in attendance for the event.

OREGON

The Oregon Watch and Clockmakers Guild has been organized to serve horologists in that area. Meetings will be held on the third Tuesday of January, April, July and October, 1983.

The principal officers of the group are: Phillip Wilkins, president; Greg Grokett, first-vice-president; Robert Seiler, second vice-president; Robert Grokett, treasurer; Richard F. Van Winkle, secretary. Roy Skinner is the AWI delegate. 58 members are currently on the roster.

Those who wish further information are asked to contact Mr. R.F. Van Winkle, secretary at 1360 Commercial St., Astoria, Oregon 97103.

NEW YORK

The Horological Society of New York, Inc., recently held a meeting featuring the Basel 1982 Fair and manufacture of quartz watches, programs presented by the Watchmakers of Switzerland Information Center, Inc. The guest speaker was Mr. Jacques Reymond, Technical Director of WOSIC, who showed slides from the last Basel Fair, and presented a film on the manufacturing of quartz watches in Switzerland.

TEXAS

The Texas Watchmakers Association, Inc., recently had Al Williams demonstrate the new TR-4 Quartz Timing Machine manufactured by L & R. Mr. Williams, with Marshall-Swartchild, has become very knowledgeable about the TR-4 and presented a very good program. There was also a tape and slide presentation on the Seiko 6139A Chronograph.

OHIO

The regular meeting of the Cincinnati Watchmakers Guild was held in October at the Holiday Inn in Cincinnati, OH. At this meeting new leaders of the guild were elected.

The Watchmakers Association of Ohio reports that their latest meeting was an outstanding success. New members of the Board of Directors were presented for their first quarterly meeting. The new members are Jake Montgomery, Bob Willen and Wally Curtiss. Members are urged to submit the names of potential candidates for the Board of Directors to be considered in the future.

WAO President, Al Brehl, extended the group's congratulations to AWI member, Brownwyn Molloy, who received the highest CMW score in recent tests and was awarded the WAO Dick Lang Award. She is the first female recipient.

Members are reminded that the WAO Annual Convention is scheduled for July 29-31, 1983 at the Marriott Inn, Hamilton Road, Columbus, Ohio.

CALIFORNIA

At a recent meeting with the Sacramento Watchmakers Association, Robert Bishop of AWI held a workshop on "Common Sense Quartz Repair." The workshop was a great success! A substantial number of watchmakers were present.

Battery News

By Ewell Hartman, CMW

Battery Number System

The BNS booklet (available from AWI for $2.00) has two battery listings which were not available for the chart distributed with the August issue of *Horological Times*. They can be added to the *chart*, following AWI number "S50".

S52 (AWI), 1.50 (voltage), 5.0 (diameter), 1.6 (height), SR516SW (Maxell)

S54 (AWI), 1.50 (voltage), 5.8 (diameter), 2.7 (height), SR527SW (Maxell)

The BNS *chart* and *booklet* have a brand new listing. It can be added, following AWI number "A07".

A09 (AWI), 1.50 (voltage), 7.9 (diameter), 3.6 (height), *192 (Everyready), *V3GA (Varta)

You will want to read this column regularly. The BNS can keep you informed on a monthly basis!

Industry News

RAYOVAC has just published a new cross-reference guide and it lists the AWI battery numbers! Congratulations, RAYOVAC, for making your guide more adaptable to our industry.

Service Ideas

Do you know how to select a satisfactory replacement for a watch in which the battery is missing (or obviously incorrect) and specifications are unavailable? The voltage and drain can generally be determined by the type of movement. The battery compartment will enable you to determine the correct diameter; however, the height (thickness) of the battery can be difficult to determine. When the watch has a battery cover or when the back of the case acts as the retainer (as in many of the newer thin watches), make a small round ball of "Rodico," place it in the center of the empty compartment, then secure the battery cover or close the back of the case. If you then carefully remove the "Rodico," you will find that it has been neatly compressed to the exact maximum height of the compartment. By carefully measuring this "dummy" with an easy-working slide gauge, the *maximum* height of the replacement battery can be easily determined.

Bench Tips / Joe Crooks



Arboring a Pallet

Send your tips to: Jingle Joe, 265 North Main St., Mooresville, North Carolina 28115.

This month's Bench Tip is from Mr. Adam Bakos, Adam's Watch Repair, 320 Utley Drive, Goodlettsville, TN 37072.

First before printing Adam's tip, I feel that he is due an apology because I thought most all watchmakers replaced pallet arbors by a similar method, and therefore we didn't use the tip. Our good Executive Secretary Mr. Milton Stevens sent me a follow-up on Adam's tip with a "polite nudge" to use the tip because it was the method he used when he was in watch repair for a living. When Milt gives me a "polite nudge" I sort of "pop to" and pay attention. So here is Mr. Bakos' tip and a reply to his request for a tip.

I would like to barter with you. This might be against your policies but I'll try. I will give you a bench tip and in exchange would like to receive one. First, the bench tip, then the exchange.

Ask any watchmaker and I'm sure most of them will say that they would rather staff a watch, then put in a pallet arbor. Many watchmakers will buy a completed pallet fork just so they will not have to put the arbor in. You know this is expensive because the arbor costs a fraction of what the fork does. I believe most of the watchmakers stake their pallet arbor jobs. With my method you virtually eliminate the staking tool. Just like everyone else, I get a lot of rusty watches with the arbor pivots rusted off, and with my method you do not mind arboring the pallet fork.

The simplest part is taking the broken arbor out, and the hardest part is putting the new one in. When I explain my method it will be just the opposite. I don't have to tell you how to take the arbor out—I take it for granted you know how to do that. Leave the new arbor as it is. Do not put it on the lathe and polish the end to make it easier to arbor—that is not necessary. All you do is take the new arbor and put it in your pin vise that you use for your winding stems. Put the arbor in your hand pin vise before you remove the old arbor. Be sure your arbor is in the vise the same distance as the old arbor. You can check that by comparison or by measuring.

When the broken arbor has been removed, put a generous amount of oil in the hole of the fork on both sides, top and bottom so the arbor will enter and exit easily. Lift the fork with your working tweezer and place it on the arbor. Make sure that the vise has been tightened around the arbor good and tight before placing the fork on the arbor. Press firmly with your tweezer and the fork will come to rest at the top of the vise. Your job is now finished, ready for the watch. If you should get a stubborn tight-fitting arbor or your measurement might be a little off, then you can always put it in the staking tool since you have already gotten it started on your fork.

I think you will always be able to put your arbor in your fork without using the staking tool. The oil and the pressure with your tweezer is all that is needed since the arbor fits friction tight. This makes a hard job really simple.

Now here is the bench tip I would like to receive in exchange: How do you tighten the combination offset cannon pinion and center wheel? I have no trouble with the regular cannon pinions and a few of the offsets, but for the rest of them I have to buy a new wheel and that gets to be expensive. Of all the thousands of watchmakers in this country that read your bench tips every month, I'm sure that someone can enlighten me on this.

I read your Bench Tips avidly each month and appreciate your tips, so I hope the above information will assist other watchmakers.

My method of arboring a pallet is very much the same, except I use the lathe to hold the pallet arbor and a pallet pin vise to hold the pallet with 10 times the safety and precision as a pair of heavy tweezers.

Since receiving Adam's tip I have checked with many watchmakers and to my surprise very few have ever heard of a pallet pin vise. This is a description of what it looks like since there is none shown in any modern tool catalog!

The pallet pin vise for the smallest ladies' watch to 12½ ligne watches is shaped like this: The two jaws come down flat and parallel on the inside. They are about 1.0mm wide at the tip and the outside of the ends are round, tapered over to a slight square tip. It has a sliding ring to open and close the jaws. One jaw is split to a slotted fork to span the pallet lever arm. The other jaw has a hole in it to go over the pallet arbor when it is held perpendicular over the arbor to bend the pallet arm up or down (The pallet is not held in this way for fitting pallet arbors).

This is my method to replace a damaged pallet arbor:

1. Chuck up the lower part of the pallet arbor tightly in the lathe with the pallet not touching the end of the chuck.

2. Place the pallet pin vise over the pallet with the slotted side across the pallet arm, and the ends of the jaws against the chuck. Line up the length of the pin vise parallel with the lathe and lock the vise firmly on the pallet.

(Continued on page 46)

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(Continued from page 20)

just as the chiming begins. Adjusting the chime cam is not easy. The cam is driven tightly onto the arbor, so it is unwise to try to twist the cam to a new position. It is better to separate the plates enough to synchronize the fourth and fifth wheels. Even this is difficult. Ease the front pivot of the fifth arbor (locking wheel) out of its hole, but be careful because the escape wheel is partly in your way. Recheck by moving the chime train by hand. At each revolution of the chime cam, the gear train should lock. Next, install the locking plate. When the gear train is locked, the chime cam and locking plate work together to permit locking of the chime train.

The chime correction mechanism must now be checked. The chime correction cam (20) is between the plates, on the same arbor as the locking plate. After the third quarter chime, the chime correction arm (19) drops into the single depression in the chime correction cam, lowering the chime correction lever (18) so that it stops the chime correction pin (17). Only at the third quarter does the chime locking occur this way. At the other quarters, the chime lock pin and chime locking lever do the job. The slightly longer hour arm on the star cam (21) is the only one of the four arms long enough to lift the chime levers enough to start the gear train for the hour.

It stands to reason that it is the slot in the chime correction cam which determines the hour and synchronizes the locking plate. We must therefore make sure that the chime correction arm (19) drops into this slot just as a chime sequence (the third quarter) ends. If it does not, there will be no chime correction. Since the chime correction cam is held on its arbor by a tension washer, it is by moving the cam that we adjust it. You cannot ease out the pivots because the third arbor has two long pivots, and the fourth has a long front pivot. In any case, you will not have to move the cam far. As long as the slot rotates to a position under the chime correction arm at the end of any sequence of chime notes, the adjustment will be correct.

The exact positions of the chime cam, locking plate, and chime correction cam are very important. To facilitate further adjustments, install the mainspring barrels with clickwheels, and the lower front movement plate. Snug down a total of eight hex nuts on the front of the movement, and make sure everything is secure on the back. Wind partially on the strike and chime springs only. Add the hour wheel (10) and the minute wheel (9) and the rack (12), and adjust the snail for correct 12 o'clock strike as we have done before with other movements. As you cause the clock to chime, note the operation of the chime correction cam. If the slot revolves under the chime correction arm too soon, the chime train will stop prematurely, with perhaps one note left to play. If the slot arrives "late", there is no chime correction at all. Careful observation and adjustment are required.

After you are satisfied with chime and strike train operation, proceed to finish the assembly of the movement. Install all remaining split washers. On the rear of the movement, we left the cover plate held on with one nut. Remove the cover plate now. Screw in the hammer shaft (28) with the hammers on it. Put in the pin barrel and gear (27), and the idler gears (25). Add the cover plate and the nuts. The buffer springs (30) allow the hammers to fall by gravity. The springs cushion the hammer action to prevent excessive bouncing. Add the chime drive gear (22) and adjust its position as we have done so often with other clocks in this series. At the first quarter, the hammers should rise and fall in order from front to rear.

To finish up, let down the mainsprings and add the movement brackets, which were left out during assembly because they get in the way. Install the verge and suspension unit, wind the springs, and test the movement.

★ I wish to thank Mr. F. H. Stevenson, repairer, and Mr. and Mrs. M. Mechling, owners, for the loan of the Jauch movement, and for their cooperation. ★

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TECHNICALLY WATCHES

(Continued from page 12)



Figure 10.



Figure 11.

4 inches long with washers and thumb screws. After the holes are drilled, the block should be sawed straight and square, making two blocks. The larger of the two blocks should be 2-3/8 inches wide and the smaller block should be 1-¼ inches wide. A V-shaped notch should be cut between the two parts of the holder for the graver to fit into. It is very important to have the notch made square across the two pieces; otherwise, when the graver is sharpened, its face will not be square with the graver. One way to make the notch is to assemble the device and use a small drill in the drill press to drill a hole between the two blocks. Make sure the device is kept flat on the drill press table while the hole is being drilled. The graver is then clamped between the blocks with one of its corners in the grooves in each block which was made by the drill. Set the graver straight in the grooves, then tighten the two blocks together on the graver with the thumb screws. This will form a V-shaped groove in each block for the graver.

Figure 12 shows the wood graver holder being used to sharpen a graver. When using the holder, the graver is extended through the holder until the face of the graver is flat on the stone. The base of the holder rests on the bench the same as the graver rests on the stone. The base of the holder is moved back and forth on the bench toward each end of the stone as the graver face rests on the stone.

Figure 13 shows a method of using two stones such as an India stone and an Arkansas stone, one on top of the other to allow the stones to be alternated without changing the graver in the holder.



Figure 12.



Figure 13.

For example, the India stone can be placed on top of the Arkansas stone and the graver sharpened; then the stones can be reversed and the Arkansas stone placed on top, as in Figure 14. Then the graver is finished on this stone.

(Continued on page 54)

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BENCH TIPS

(Continued from page 44)

3. Turn the lathe head with the left hand and pull straight out with the right hand to remove the pallet from the arbor. LEAVE THE PALLET FORK IN THE PALLET FORK PIN VISE for proper depth on the NEW ARBOR.
4. Depth gauge the damaged pallet arbor in the lathe chuck before removing and then loosely friction chuck up the new pallet arbor. Push it in the chuck with the depth gauge for correct length and tighten securely.
5. Turn the lathe head with the left hand while pushing the pallet on the new arbor until the tips of the pallet fork pin vise butt against the lathe chuck for correct depth. NOTE: I have never used oil to fit pallet arbors by this method, because with the firm grip on the pallet in the pallet pin vise it is not needed. If the new arbor is a little too tight it can be turned down with a graver or

(Continued on page 56)

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G	Repairing the ESA 900.911 Digital/Analog	Biederman
H	Clock Restoration	Benesh
I	Introduction to Striking Clocks	Baier
J	Common Sense Quartz Watch Repair	Bishop
K	Introduction to Clock Repair	Benesh & Whitney
L	Bulova Quartz 262 and 2500	Sustachek

JANUARY 1983

15-16	J	Nashville, TN	Bishop
24-28	K	Cincinnati, OH	Whitney & Benesh

FEBRUARY 1983

12	A	Mobile, AL	Jaeger
12-13	J	Kansas City, MO	Bishop
13	L	Houston, TX	Sustachek
18	C (a & c)	Tacoma, WA	Broughton
20	C (a & b)	Portland, OR	Broughton
26-27	I	Albuquerque, NM	Baier

MARCH 1983

5-6	J	Pittsburgh, PA	Bishop
13	G	Huntsville, AL	Biederman
24	L	Tacoma, WA	Sustachek
26	L	Portland, OR	Sustachek
26-27	J	Annapolis, MD	Bishop

MAY 1983

20	L	Texas Watchmaker Convention	Sustachek

JUNE 1983

6-10	K	Cincinnati, OH	Whitney & Benesh

SEPTEMBER 1983

17-18	J	Huntsville, AL	Bishop

I AM INTERESTED IN YOUR BENCH COURSE TO BE PRESENTED ON _____ AT _____. PLEASE SEND ME MORE INFORMATION.

NAME: _____

ADDRESS: _____

CITY, STATE, ZIP: _____

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Froidevaux & Sons/USA Offers Quartz Timer Through Wholesalers

Quartz Timer from Froidevaux & Sons/USA



The Etic division of Albert Froidevaux & Sons/USA is now offering, through wholesalers throughout the United States, what they claim is the most economical quartz timer available. Called the Speedy Trim Mark I, this timer can be used to time digital or quartz analog watches, with or without the module in the case. The watchmaker or technician can trim (adjust the watch frequency) with a watch laying face down on the pick up. Suggested list price for this item is $690.56. For a complete Etic catalog, send $1.50 to: Albert Froidevaux & Sons/USA, 11718 West 91st Street, Overland Park, KS 66214. Tools and supplies sold through authorized wholesalers only.

BRASS CLOCK AND BAROMETER AVAILABLE FROM CHELSEA

Accented with a solid brass case, the 4½" ship's bell clock and matching barometer from Chelsea Clock Company, Inc., are ideal gifts for use in the home or office.

The jeweled timepiece features gold-plated movement and adheres to strict maritime regulations. The matching barometer is available with a 3-scale dial, reading inches, millibars and centimeters. Mahogany display bases are optional.

The clock and barometer carry a suggested retail price of about $900.00 for both. Chelsea Clock has been producing timepieces since 1897. For further information, contact: Chelsea Clock Company, Inc., 284 Everett Avenue, Chelsea, MA. 02150; (617) 884-0250.



Chelsea's clock and matching barometer

JA INTRODUCES CONSUMER BROCHURES ON JEWELRY CARE

As part of its ongoing consumer education program, Jewelers of America (JA) is introducing a new brochure entitled "What You Should Know About the Care and Cleaning of Your Fine Jewelry." This is the sixth in a series of informative brochures designed to help jewelers reinforce customer confidence by offering them advice on all aspects of buying and caring for fine jewelry.

This most recent brochure, developed with the cooperation of Diamond Information Center, International Gold Corporation, and Cultured Pearl Association, describes the importance of proper care of fine jewelry to assure its lasting qualities and gives guidelines and tips for storage and cleaning of diamonds, colored gemstones, gold and pearls.

Jewelers interested in purchasing these brochures for use as a promotional mailing, as a counter handout or statement stuffer, or as the source of information to the local press, may write to the JA office for information about prices and an order form. JA members will be receiving a sample of the brochure in their "J Report." JA's address: Rockefeller Center, 1271 Avenue of the Americas, New York, NY 10020; (212) 489-0023.



JA's consumer brochure

SWEST ANNOUNCES PUBLICATION OF BUR BROCHURE

Swest, Inc. has a new 12-page comprehensive booklet containing a complete range of assortments and individual burs for the jeweler. It includes actual size line drawings of shapes and sizes available. The high speed steel burs include dimensions in both millimeters and inches, and the carbon steel burs include both millimeters and ISO numbers. Makes an excellent reference guide for every workbench.

For further information contact: Swest, Inc., 10803 Composite Drive, Dallas, TX 75220; 5805-A Peachtree Corners East, Norcross,GA 30092; 1725 Victory Boulevard, Glendale, CA 91201.

MIDO'S BJORN BORG LINE WITH MATCHING CUFF LINKS

The famous Bjorn Borg Line is now available as a set with matching cuff links with yellow gold electroplate center and stainless steel edge. A further variation offers this timeless design with steel center and 18K yellow gold edges, as well as diamond set dials. For new No. 1 Catalog, write to: MIDO/BOREL, 818 Grand, Kansas City, MO 64106.



Bjorn Borg Line from Mido/Borel with matching cuff links

CORUM UNVEILS NEW STATUS WATCH

Corum has added a new model to its collection of specialty watches. This fall Corum introduced a ladies' mini-Rolls Royce watch.

Several years ago Corum introduced a status watch for men, styled after the world's most famous radiator grille—the Rolls Royce. Made of 18 karat gold and set with glittering diamonds, the Corum mini-Rolls Royce watch is as distinctively individual as the wearer herself. The new ladies' Rolls Royce watch has the same unique styling as the men's, but in a smaller version with more petite proportions. The watch is available in strap or bracelet styles. Contact: Corum Watch Corporation, 650 Fifth Avenue, New York, NY 10019; (212) 397-7800.



Corum's new mini-Rolls Royce watch for ladies

ELECTRONIC SIGNS AVAILABLE FROM KASSOY

New, attention-getting motion signs, in three different sizes and price ranges, are now available for promotion-minded jewelers.

These signs crawl, pause, flash and roll, allowing the retailer to promote new products, sell today's specials, quote latest gold prices, talk about credit terms or program whatever message he wishes. Simple-to-use typewriter style programming gives the merchant total copy flexibility.

Letter sizes are 4", 2", and 1¼" high with corresponding prices of $2000, $1,400, and $495. These indoor motion signs allow the retailer to promote extra sales, events and projects attractively and effectively. For further information contact: Kassoy, Diamond Club Bldg., 32 W. 47th Street, New York, NY 10036; (800) 223-5530.



Electronic sign from Kassoy is available in three different sizes.

PORTESCAP U.S. INTRODUCES A SCIENTIFIC DIAMOND PROBE

The Vibrograf Machine Division of Portescap U.S., Lake Success, NY has introduced the new Vibrograf CD-2000 Diamond Probe Analyzer.

Mr. Joseph Presti, general manager of Portescap U.S., stated, "The Vibrograf CD-2000 is the ideal instrument for checking the genuineness of diamonds."

Based upon the diamond's physical property of a diamond conducting heat faster than any of the known diamond simulants, such as Cubic Zirconia, Stronthium, Titanate, YAG, Synthetic Spinel, and others, the CD-2000 provides an instant acoustic or visual signal when testing a diamond's authenticity.

The Vibrograf CD-2000 is a compact, portable instrument powered by rechargeable cadmium cells. Portescap guarantees the CD-2000 for a period of two years. For further information, contact: Portescap U.S., 6 Ohio Drive, Lake Success, NY 10042; (516) 437-8700.



Vibrograf CD-2000 Diamond Probe Analyzer from Portescap U.S.

SEIKO INTRODUCES NEW LASSALE TIMEPIECE

The beauty of a pocket watch—offering the hour just neatly pocketed away—makes this watch a popular gift item. It's among 21 new Seiko Lassale quartz watches introduced by Seiko Time Corporation recently.

From the HJX Series, this timepiece offers a slim elegant gold-tone case with matching link chain, gilt dial and minute track. This selection is available through the company's nationwide network of distributors.



Seiko's new Lassale Pocket watch

TWO NEW SKELETON CLOCK MODELS INTRODUCED TO U.S.

Two new skeleton clock models (Floral and Lantern) were introduced recently to the U.S. by Thwaites and Reed. Both clocks are eight-day spring wound timepieces of traditional design, with quality movements.

Thwaites and Reed, a subsidiary company of F.W. Elliott Ltd., maintains the Great Clock at Westminster, London (popularly known as Big Ben). The firm has been producing clocks since 1740 and specializes in skeleton and carriage models. Approximate retail price of the Floral and Lantern clocks is $420 each. Contact: F.W. Elliott Inc., 26 Kennedy Boulevard, East Brunswick, NJ 08816; (201) 846-8856.



Floral clock model introduced to the U.S. by Thwaites and Reed.

NEW FEATURE SHOWCASE FROM BERG COMPANY

Berg Company, division of DEC International, Inc., has added a new feature case to its Regency® series of showcases for higher profit items. The feature case stands 35½" high and measures 22" deep and 48" long. Display area is 9" high. Locks are optional.

The Regency® line is made from newly-designed extrusions that provide a more streamlined appearance and especially rigid construction. The extrusions include a patented locking device for ease of manufacturing and increased rigidity. For additional information, contact: Berg Company, division of DEC International, Inc., P.O. Box 7065, Madison, WI 53707.

Berg Company's feature case



Pulsar Dedicates its New Headquarters



Pulsar Time, Inc.'s new and expanded corporate headquarters.

Pulsar Time, Inc., recently moved to its new and expanded corporate headquarters in Mahwah, NJ. At the official dedication ceremony, Arthur J. Cohen, president of the company which markets the Pulsar watch brand in the U.S., stated that the new 89,000 square foot facility is more than twice the space occupied at its previous headquarters in Allendale, NJ. "The new facility has one of the most modern and efficient warehouses, shipping facilities, service centers, and computer service operations in the U.S. watch industry," Mr. Cohen pointed out.

JEWELRY INDUSTRY COUNCIL LAUNCHES NATIONWIDE CONTEST

Diamonds are for lovers, says the Jewelry Industry Council, and to prove its point the council has arranged an exciting new contest with BRIDE'S Magazine titled "Diamonds of Love." This contest will award attractive diamond jewelry prizes to brides and grooms for the best answers to the statement, "What a Diamond Engagement Ring Means to Me."

The contest will be featured by BRIDE'S in a full page in its February/March 1983 issue with photos of the diamond jewelry prizes for the winners and the names of the contributing manufacturers. An entry blank will be included. The council will announce the contest winners to the trade in June and BRIDE'S will publish their names in its August/September 1983 issue.

The grand prize in the contest is a diamond bracelet from A. Jaffe and Son for the bride and a diamond-accented watch from Baume & Mercier for the groom. The second prize is a diamond starfish pin from Suna Bros. for the bride and a set of diamond-studded gold cufflinks from Howard H. Sweet & Son for the groom. The third prize is a diamond pendant from Artcarved for the bride and a diamond tie clip from Kaspar & Esh for the groom. The council will arrange for the prize items to be delivered to the winners.

MARIA OLIVERI JOINS SEIKO

Maria T. Oliveri has joined Seiko Time Corporation in the newly-created position of national sales manager, incentive/awards.

Ms. Oliveri had previously been national premium sales manager of Minolta Corporation for the past five years, where she developed major programs for Fortune 500 companies.

The new Seiko executive is a member of the national Premium Sales Executives, Inc., and currently serving on the Board of Directors of the Incentive Manufacturers Representatives Association and the Premium Merchandising Club of New York.



Maria Oliveri, the new national sales manager, incentive/awards, of Seiko Time Corporation.

HERB FAITHFULL JOINS BULOVA

Herb Faithfull has joined the Bulova Watch Company as sales vice president, national account development for the western United States, announced by David Richardson, vice-president of national sales.

Mr. Faithfull was director of sales for Citizen Watch Company for the past seven years. He has more than 34 years of experience in the jewelry and watch industry, including the presidency of his own company. An immediate past president of the Twenty-Four Karat Club of Southern California from 1974-78.

Mr. Faithfull currently is a member of the Southern California Guild of the American Gem Society. He also is Chairman of the Pacific Jewelry Show Committee.



Herb Faithfull, sales vice-president of Bulova Watch Company

TWO AMERICAN JEWELERS GRADUATE FROM CFH INSTITUTE

The summer session of the CFH Institute's four-month Comprehensive Course on Watch and Jewelry Shop Management ended recently. Thirty participants received the Diploma awarded by the Institute. They came from Australia, Belgium, Denmark, Ireland, France, Great Britain, Italy, Luxembourg, Sweden, Switzerland, Thailand, and the United States.

This course is especially designed to prepare future owners and managers of watch and jewelry shops to assume the responsibilities and duties of their position. Because there has been a steadily increasing demand for this unique training opportunity, the applications must be sent several months in advance. The spring session starting Jan. 31 is fully booked. Applicants interested in the summer session should write immediately to: CFH Institute, P.O. Box 206, CH-1001, Lausanne.



Two U.S. laureates were among the 30 young jewelers attending the international CFH course in Lausanne, Switzerland this summer.They are: Radhika Sarin, and Nelson Holdo.

ANN MILLER TAKES CONCORD WATCHES ON NATIONAL TOUR

Dancer Ann Miller is a stickler about time. That's why when she and Mickey Rooney finished their run in the musical "Sugar Babies" in New York, its producers Terry Allen Kramer and Harry Rigby gave her the two Concord Collection watches she admired as a closing night gift. Ann Miller will be starring in "Sugar Babies" in a year-long national tour that will include stops in Chicago, Boston, Philadelphia, St. Louis, San Antonio, Denver, Miami, Los Angeles and San Francisco.

"My dance routines must be timed perfectly—timing is really the most important thing in my life," Ann said. "As a matter of fact, I'm written up in Guinness for being able to do more taps per minute than any other dancer in the world."



Ann Miller

SEIKO CONTINUES AS PACESETTER OF TECHNICAL SEMINARS FOR JEWELERS

Seiko Time Corporation's popular seminars for watchmakers continues throughout the United States with great intensity.

The seminar presentation, titled, "Servicing the Exterior of a Seiko," was presented by Jack Schecter, Seiko's manager of technical service. Utilizing audio visuals, the seminar included an informative slide lecture on opening and closing the most popular Seiko cases, including the insertion of crystals, replacement procedures for batteries, adjusting bracelets, and the use of proper tools. A film on Seiko quartz and a discussion on servicing quartz watches provided an in-depth perspective on the state of quartz technology today and future possibilties.

Seiko's technical program was recently presented at the Great Falls Vocational & Technical Training Seminar Center, in Great Falls, Montana; at the Spokane Community College, in Spokane, Washington; and at the Oregon Watchmakers Association, in Salem, Oregon.

Seiko's upcoming technical seminars for Spring/1983 include: April 16-17, at the Michigan Watchmakers Association Annual Convention, in Clare, Michigan and May 21-22, at the Texas Watchmakers Association Annual Convention, in Fort Worth, Texas.

Jack Schecter presents seminars on servicing Seiko products.





Tim Roop of Eldridge, MO, left, a PJC student, and Bob Howell, horology instructor, demonstrated watchmaking skills during the international Gem, Mineral and Jewelry Show held recently at the Market Hall in Dallas, TX. Sixty-nine jewelry, horology and gemology students from PJC demonstrated their skills in a special educational exhibit.

GEMOLOGICAL POINEER ROBERT M. SHIPLEY JR. DIES

"I know the gemological community will join me in mourning the loss of Robert M. Shipley, Jr. His contributions advanced the science of gemology beyond measure," commented GIA president Richard T. Liddicoat, Jr. "And his passing marks the end of an era."

The son of Robert M. Shipley, the eminent founder of GIA and AGS, Robert Shipley, Jr. was a pioneer in his own right and was responsible for many advances in the technology of gem-testing instruments.

Born sixty-nine years ago in Wichita, Kansas, Shipley attended the university there and studied aeronautical engineering. He learned gemology at his father's knee and, in the 1930s, assisted his father in establishing GIA. He is credited with coauthoring many of the early correspondence courses, and he was director of education and research from 1937 to 1940. He died recently in Santa Rosa, CA.

ACCIDENT TAKES LIFE OF INDUSTRY EXECUTIVE

Frances Horowitz, vice-president of L&R Manufacturing Company, was struck and killed recently as she waited on the station platform for her commuter train. Ms. Horowitz was with L&R for more than forty years. She was known and respected throughout the jewelry industry for her loyalty and dedication to industry organizations.

Classified Ads

Regulations and Rates

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

Horological Times, P.O. Box 11011, Cincinnati, OH 45211. (513) 661-3838

Tradesman

TRADE WATCH REPAIR—STEP-MOTOR, QUARTZ ANALOG, MECHANICAL, ACCUTRONS, 32 YEARS EXPERIENCE, GEBHARDT'S WATCH REPAIR, CMW, BOX 207, NORTHUMBERLAND, PA 17857 (717) 473-3149.

CLOCK WHEEL AND PINION CUTTING, repivoting, retoothing, escapement work. J. C. Van Dyke, CMW, CMC, CMBHI, 1039 Rt. 163, Oakdale, CT 06370.

CLOCK SERVICES wheels, gears, barrels, retoothing, repivoting, mainspring winding, bushing, jeweling. Send sample for estimate. SASE. Roy H. Niegel, CMC, CMW, 21837 Woodbury, Cupertino, CA 95014. (408) 253-4927.

Trade Watch Repair. Step-Motor. Quartz Analog. Mechanical, Accutron. 35 Years Experience. Newton III Watch and Clock Repair. 1064 W. Minnehaha Ave., St. Paul, Minn. 55104. (612) 489-3439.

Quality Repairs—Certified Watchmaker, Accutron No. 824—Bulova Quartz No. 2104—Rolex No. R213—25 years experience—Louis Wilkins, Box 527, Clyde, Texas, 79510, (915) 893-5097.

CLOCK WHEEL AND PINION CUTTING—Fast Service—Write for free brochure and price list. Fendleys, 2535 Himes St., Irving, TX 75060.

CLOCK WHEELS, PINIONS, PALLETS, ETC., Custom made or repaired. Music Box Governors Rebuilt. Free Estimates. No watch parts please. David Arnold CMC, CMBHI, 556 Ann St., Elgin, IL 60120; (312) 695-1689.

LED & LCD MODULE REPAIRS complete module repairs on all Bulova, Pulsar, Hamilton, Gruen, Elgin & Waltham, Benrus, and non-brand name modules. E & M Associates, 109 Bank St., Waterbury, CT 06702. (203) 753-5715.

You! Have tried the rest—Now! Try the best for your custom made Horological and Instrument Parts and Tool repair. Precision Instrument, P.O. Box 70004, Charleston, SC 29405 Phone: (803) 553-1198.

PULSAR WATCH REPAIRS. Complete repairs on all L.E.D. PULSARS except calculators. Prompt service. Leo G. Kozlowski, 55 E. Washington Street, Chicago, IL 60602. (312) 236-8052.

QUALITY CRYSTAL FITTING—All types—Glass—Plastic—Mineral. Send work to Crystal Fitter's Inc., 21 North Street, Middletown, New York 10940. Phone: (914) 343-4434.

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

Pearl and Bead Restringing. All types. Fast service. Jean A. Gruenig, P.O. Box 12007, 1279 Inglis Ave., Columbus, Ohio 43212.

THE QUARTZ SPECIALISTS. All services on Analog, LCD, LED, Accutron. Lowest prices on batteries. Free information packet. McBee Laboratories, 302-D So. 16th, Bozeman, MT 59715.

Wheels, pinions, barrels or whatever, repaired or made new. Repivot arbors. No watch parts. Ken Leeseberg, Ken-Way Inc., 19 W. 672 Army Trail, P.O. Box 219, Addison, IL 60101.

Superior Tweezer Resharpening $2.50 each, including return first class postage. Minimum of three tweezers. Advance payment required. Harvey C. Watkins, CMW, P.O. Box 1738, 1204 West Cason Street, Plant City, FL 33566

Watch Repair for the Trade. Contact Little Switzerland Ltd., Swiss Master Watchmakers & Jewelers, P.O. Box 3195, Hilton Head Island, SC 29928, Phone: (803) 785-7661.

Help Wanted

Help wanted: Experienced Watchmaker—All around mechanic including quartz, Colorado. Five day week. Send Resume: PO Box HW-1282, 3700 Harrison Ave., Cincinnati, OH 45211. Include salary requirements.

Sales representatives wanted. Well-established wholesale jeweler's supply and watch material house in the Midwest looking for representatives with jewelry store and/or watch material backgrounds to travel Virginia, North and South Carolina, Georgia, Alabama, Mississippi, Arkansas, Missouri, Iowa and Wisconsin. Good benefits. Salary commensurate with ability. Write: Box HW 1182, 3700 Harrison Ave., Cincinnati, OH 45211.

High-grade Watchmaker for pleasant retail working environment. Previous watchmaker retiring after 24 years. George York Jewelers, Genesee Mall, Auburn, NY 13021.

Wanted: Watchmaker—Experienced in all phases of watchmaking. Some jewelry repair preferred. Live and work in sun belt. Send resume to: Jim's Jewelers, 1817-c Troup Hwy., Tyler, Texas 75701

For Sale

ESEMBL-O-GRAF LIBRARY in 28 volumes, Pittsburgh, 1955. Chronograph repairing is made easy by step-by-step procedure. Each small step of removing and replacing each part and making adjustments is clearly illustrated. No concentrated study is necessary. $200. Write EOG, P.O. Box 11011, Cincinnati, OH 45211.

U.S. HEADQUARTERS FOR ALL SCHATZ PARTS. PARTS FOR THE NEW 400-DAY ELECTRONICS. ALSO FOR KUNDO ELECTRONIC. GREENHILL CLOCK SERVICE, P.O. BOX 172, SANTEE, CA 92071.

HIGH GRADE MOVEMENTS: Brand New Piguet 99–9 Lines–18 Jewels. Duofix Shockproof–(Mechanical) ESA 959.001–1.5 millimeters thick (quartz). Reasonable Prices–Call or Write: Julio G. Macat, 10556 Clarkson Rd., Los Angeles, California. Ph. (213) 559-1604.

DIGITAL WATCH REPAIR OPPORTUNITY Complete Zantech testing equipment, new condition. Tools, parts, batteries and supplies. $3268.00 value only $1960.00 cash. Farrell (714) 224-6166, 3017 Tennyson St., San Diego, CA 92106.

MINIATURE TEST PROBES especially designed for quartz watch repair–wire twice as flexible and half the diameter as standard test wire–pin tips one-third the diameter are replaceable. $12.00 postpaid. Quartz Timepiece Repair, 213 Taylor, Box 304, Ryderwood, WA 98581; (206) 295-3624.

AVAILABLE JANUARY: Small First Class Jewelry Store. Excellent for watchmaker-wife team. Proven moneymaker for thirty years. Recently remodeled. Retiring to the deep south. $5000.00 for turnkey operation; includes store name, fixtures. Safe, etc. Excellent lease $300. month includes heat-water-sewer. Active downtown area. Harry E. Wysong CMW 807, AWI No. 3245, OWA No. 277, P.O. Box 142, Kent, OH 44240.

Jewelry and Watch Repair in West Chicago suburb. Seller to retire after 38 years. Good repair business. Financing available to qualified buyer. VRBB (312) 640-8330.

For Sale–Timing Machines, Watchmaster Timers, Vibrograf Timers. Factory rebuilt. All machines guaranteed. Terms available. Also available Ultrasonic Watch Cleaning Machines. Write Vibrograf sales representative Robert Swensgard, 2630-A Jett Hill Road, New Richmond, OH 45157. Or phone (513) 553-2113. Territory: Kentucky, Michigan, Ohio, Tennessee, and Western Pennsylvania.

Metal Cutting Lathes, Bench Mills, Drillpresses, Unimats (accessories also), Maximats, Sherline, Cowells, Enco, the Maximat Super Eleven. Lathe Catalog $1.00. Precision tools inch or metric, aluminum, brass, steel, all shapes, miniature screws, taps, drills, saws, collets. Tool Catalog, $1.00. Campbell Tools, 2100E Selma Road, Springfield, Ohio 45505. Phone (513) 322-8562.

Wanted To Buy

Buying Watchmakers Tools, Material. American Pocket Watches, Movements, Cases. G.W. Raab, 504 Southgate Dr., Tomahawk, WI 54487–(715) 453-4305.

IMMEDIATE CASH PAID for Gold, Silver, Platinum, any form! Jewelry scrap, filings, gold filled, sterling! Immediate top dollar cash offer return mail! Satisfaction guaranteed. Ship insured/registered mail to: American Metals Co., St. Andrews Branch, P.O. Box 30009H, Charleston, SC 29407.

STERLING FLATWARE STOCKS–new or used needed. Call us before you sell for scrap. Also wanted: silver, diamonds, gold scrap, coins and coin collections. Call or write: Mr. Neff, HT, WFN Enterprises, 2300 Henderson Mill Rd., N.E. Suite 318, Atlanta, Georgia 30345. Phone (404) 938-0744.

IMMEDIATE CASH PAID!!Old Mine and Old European cut diamonds. Especially needed: Stones over 1 carat. Ship with phone number for highest offer, or call Mr. Neff, (404) 938-0744. W.F.N. Enterprises, Inc., HT, 2300 Henderson Mill Rd., NE, Suite 318, Atlanta, GA 30345.

Books

Fundamentals of Electronic Watches, 120 Pgs., 60 Ill., $10.00. New Selection of Lathe & Milling Books. Send for List–SCANLON HOROLOGICAL BOOKS, P.O. Box 379, Modesto, CA 95350. (209) 524-9789.

Miscellaneous

DIGITAL, QUARTZ TRAINING – Learn the Zantech 60 second method of testing quartz analog watches. Zantech, the originator of the Two Day Digital Watch Service Program is now also offering a Two Day Quartz Analog Repair Course with expert instructors, Louis A. Zanoni and Anne Louise Brackbill. For application or information call or write to Zantech, Inc., 77 Shady Lane, Trenton, NJ 08619. (609) 586-5088.

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THE DIGITAL WATCH REPAIR MANUAL

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This 76- page, handsomely printed and easy-to-read version contains all of the practical information of the original plus added features, including a glossary of electronic terms and milli ampere hour battery chart. This fully illustrated "How to do" manual covers the most frequently encountered repairs required of both the LED and LCD watches. The information in this book is fundamental and pertinent to all quartz watches.

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Dates To Remember

JANUARY (1983)

9-13—Atlantic City China and Glass Show, Atlantic City Convention Center, Atlantic City, NJ.

14-19—Bijorhca: International Jewelry, Clocks, and Gifts Exhibition; Parc des Expositions; Porte de Versailles; Paris, France.

22-24—Jewelers International Showcase Fine Jewelry Show; Miami Beach Convention Center; Miami Beach, FL

16-23—International Exhibition of Gold, Jewelry and Silverware; Vicenza, Italy.

23-28—96th California Gift Show; Los Angeles Convention and Exhibition Center, CA

30-Feb. 1—The Southern Jewelry Travelers Association Southern Jewelry and Gift Show; Hyatt Regency Hotel; Atlanta, GA.

FEBRUARY (1983)

5-11—United Lapidary Wholesalers Show; Ramada Inn; Tucson, AZ

5-8—Inhorgenta '83; The International Trade Fair for Watches, Clocks, Jewelry, Precious Stones and Silverware; Munich Fairgrounds; Munich, West Germany.

5-10—American Gem Trade Association Show; Doubletree Hotel; Tucson, AZ.

6-9—Jewelers of America Spring Show; Hilton and Sheraton Centre Hotels; New York, NY.

10-14—Spring Macef: International Gift, Accessories and Silverware Show; Milan, Italy.

13-19—Independent Jewelers Organization Spring Convention and Buying Show; Concord Hotel, Lake Kiamesha, NY.

20-22—Dallas Spring Jewelry Show; Dallas Market Center; Dallas, TX.

26-28—Spring Pacific Jewelry Show; Moscone Convention Center; San Francisco, CA.

27-Mar. 1—MJ&SA Expo/New York; Sheraton Centre; New York, NY.

28-Mar. 6—Watch Material & Jewelry Distributors Association Convention; Stanford Court; San Francisco, CA.

MARCH (1983)

5-8—77th Denver Gift and Show, Denver Merchandise Mart and Exposition Center; Denver, CO

10-13—Texas Jewelers Association Convention; Amfac Hotel; Dallas-Ft. Worth Airport; Dallas, TX.

19-20—Missouri Jewelers & Watchmakers Association Convention; Howard Johnson's Hotel; Springfield, MO

APRIL (1983)

10—Spring Technical Seminar; Iowa Jewelers & Watchmakers Association; Best Western Airport Inn; Des Moines, IA.

9-11—Alabama Jewelers Association Convention; Governors House Motor Hotel; Montgomery, AL.

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TECHNICALLY WATCHES

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Figure 14.

Figure 15 shows an Arkansas stone and boxwood block combination. First the graver is sharpened on the Arkansas stone while it is on top of the boxwood block. Then the boxwood block is placed on top to be used for polishing the face of the graver. Alcohol and Linde A are used on the boxwood block for polishing the face of the graver.



Figure 15.

Figure 16 shows an India stone and number 4/0 polishing paper combination. The polishing paper is glued to a flat piece of plate glass. First, the India stone is on top of the glass with its paper while the graver is sharpened. Then the two are reversed and the face of the graver is polished on the polishing paper.



Figure 16.

In these examples, it is unnecessary to change the height of the graver in the holder during the grinding and polishing operations.

Carbide gravers will be discussed next month.

I would like to take this opportunity to wish all of my readers a MERRY CHRISTMAS and a HAPPY 1983!

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BENCH TIPS

(Continued from page 46)

Arkansas stone with no need to change the depthing in the chuck.

My method to tighten offset C/P's is as follows:

First, you must remove the little devil. If possible I chuck up the wheel in the lathe. Remove the C/P using a pin vise with a twist and pull motion. If it can't be chucked in the lathe use Dumont 15A fine cutting "V" edge tweezers (or equivalent) placed between the wheel pinion and the cannon pinion, and gently squeeze. The C/P will pop off with no damage to the pinions.

To tighten the C/P, you can make a tool from a pair of toe nail clippers. Buy the ones that are square across the end or slightly convex. At three different places squeeze the clips gently on three different size needles. This will make slightly round holes in the clips. Stone off the burrs on top and inside and you now have three different size semi-round holes that are slightly blunt on the cutting edge.

If you try to tighten a C/P between two parallel sharp jaws you are notching at one to three degrees on each side. This is okay with a long C/P that flexes over the wheel and tightens back up when snapped on. The short off-center C/P's don't flex nor return much no matter how hard they are tempered. This is why you need a tool that will notch both sides of the C/P at ten to fifteen degrees on both sides with a blunter notch than it had when it loosened up. The blunter notch also gives you more friction on the top side of the concave of the offset wheel, along with more gripping surface around the wheel.

To tighten, slide the C/P on a Bergeon No. 70 tempered smoothing broach, the pinion end first, until it binds. Select the proper size diameter hole in the clip tool and gently close over the factory notches in the C/P and pull it out about 5.0 mm on the broach. Then while turning the broach, squeeze until you feel the broach bind.

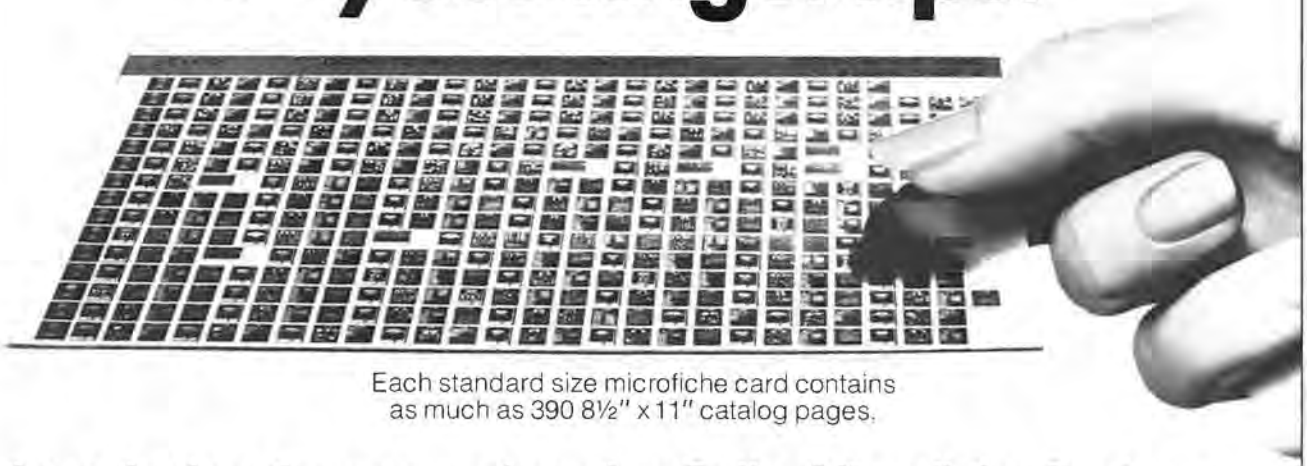
IMPORTANT: Clean the wheel and C/P, then grease tip of wheel with molybdenum disulphide before snapping C/P into place with a flat hollow punch on the staking tool.

If not tight enough, repeat process by moving the C/P 1.0mm more out on the broach each time before tightening until you have the proper tension.

If too tight (which is rare), grasp the C/P in the notches with the tightening tool while it is on the wheel and gently squeeze and twist back and forth. The C/P notches will reseat on the wheel to the proper tension without removing it from the wheel.

CORRECTION: NOVEMBER 1982 BENCH TIPS
On page 35, 2nd column, 2nd sentence should read: "Toothpicks are so easy to use it's a wonder why there are still some clockmakers who don't peg bearings in the plates."

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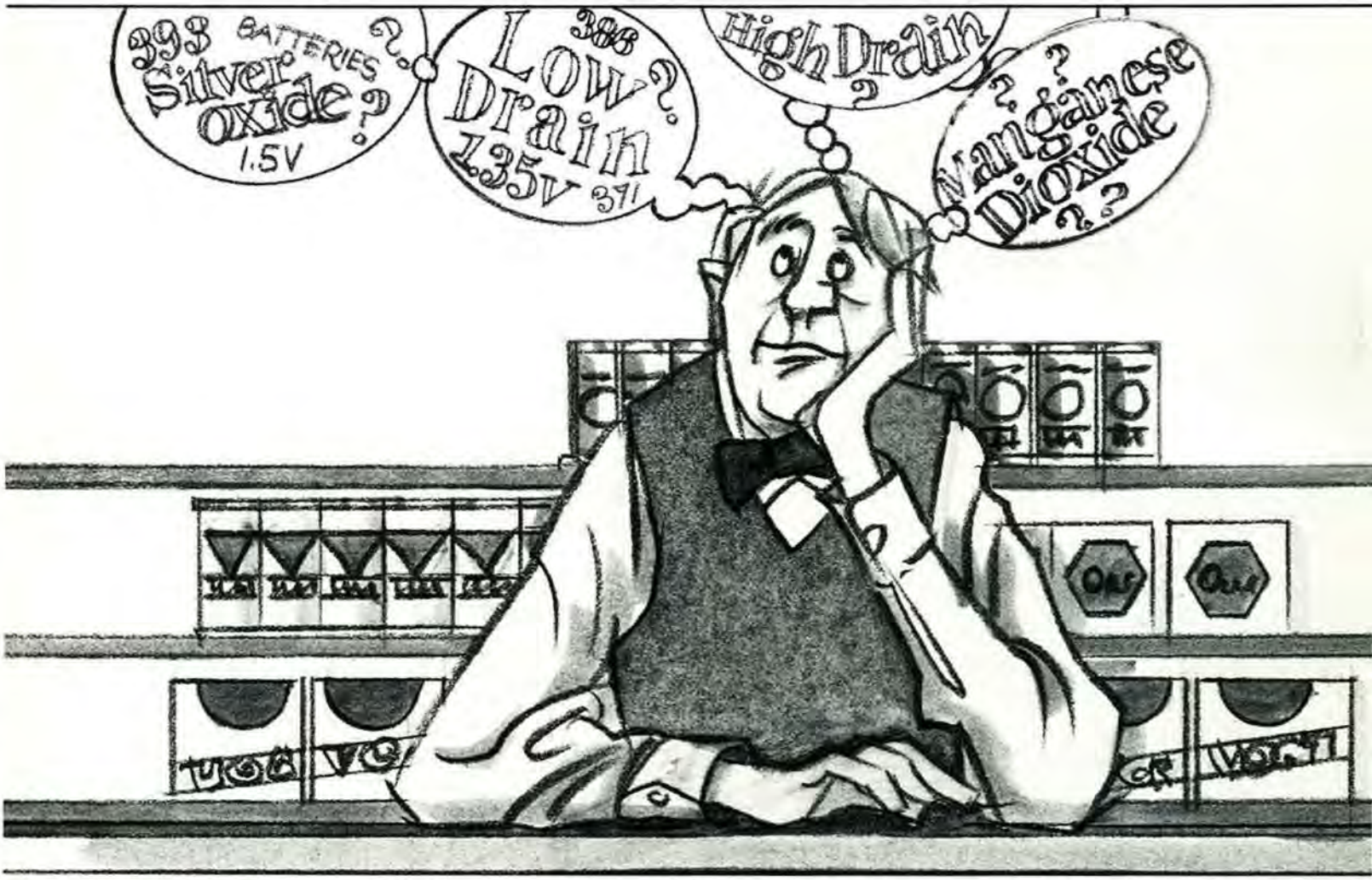
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