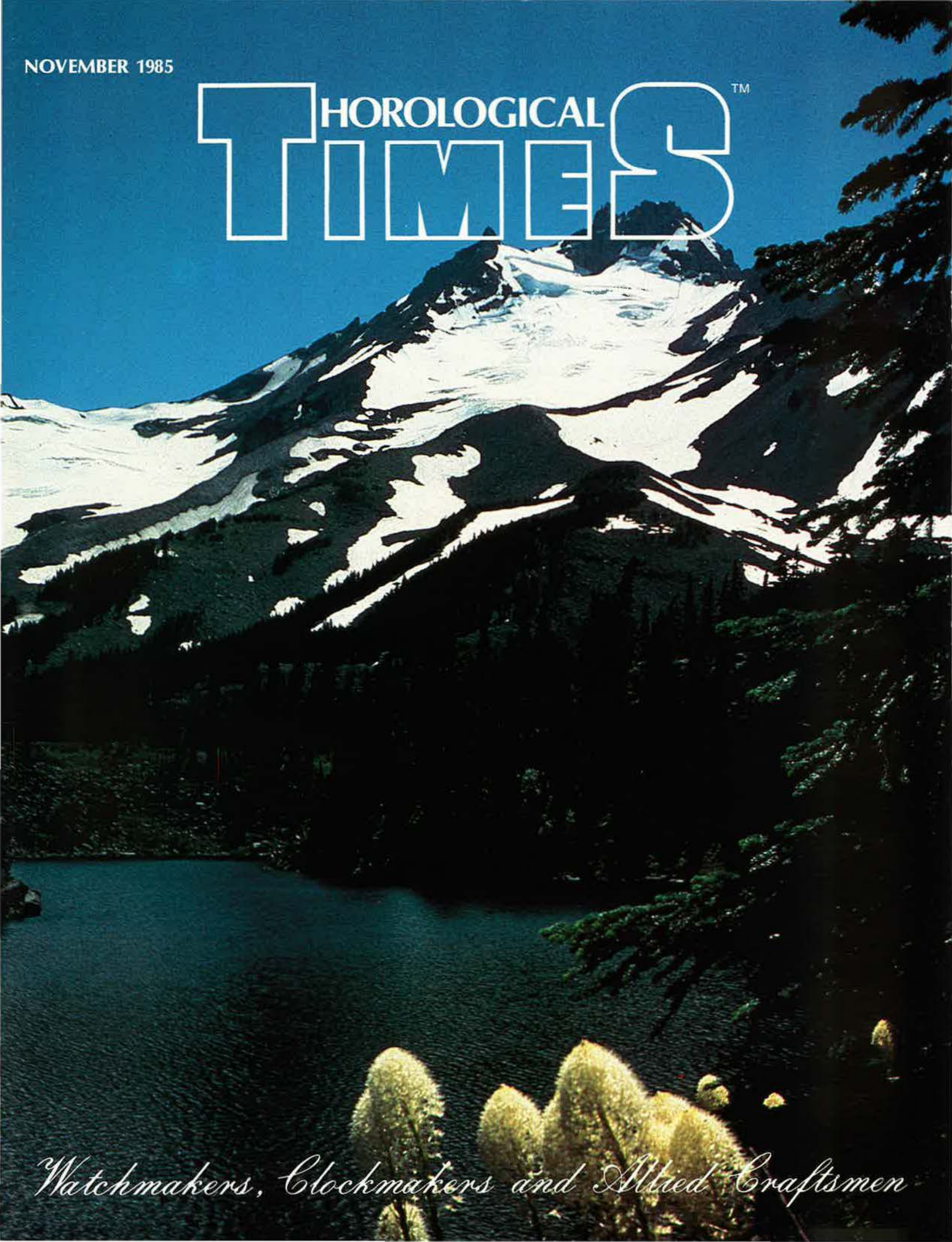
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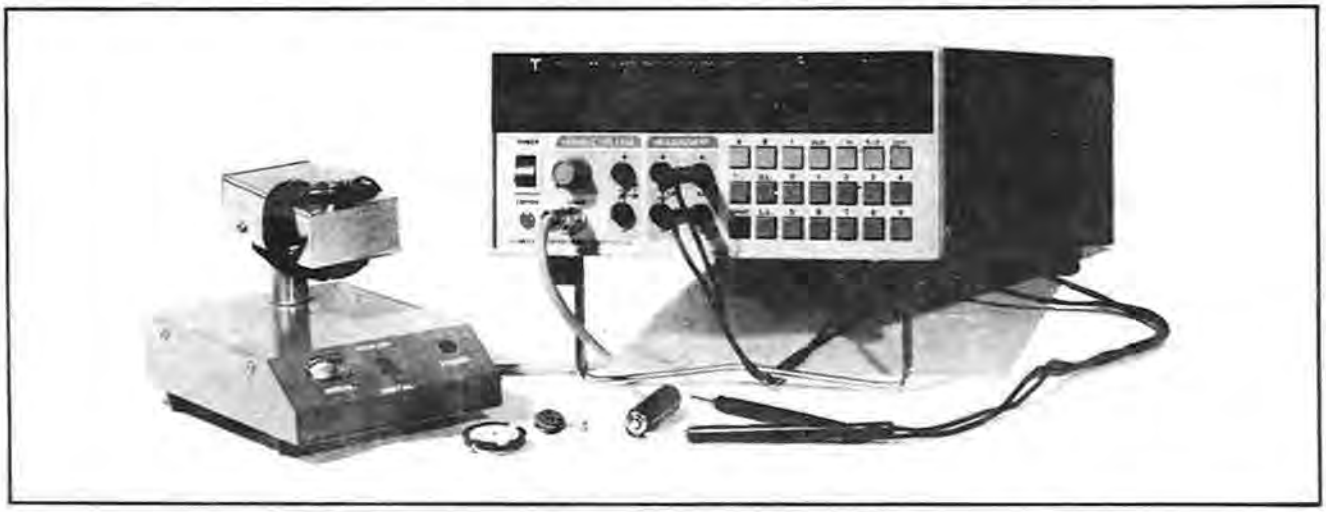


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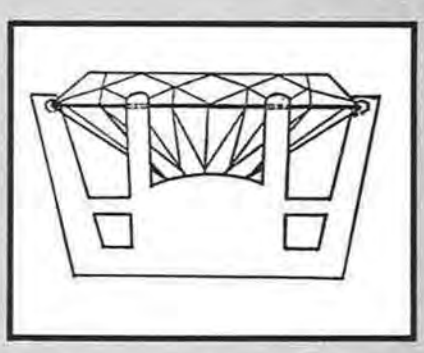
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Editorial

TUESDAY, NOV. 5th – Doctor –12:30 PM
FRIDAY, NOV. 8th – AUTO REP. – 8:00 AM
MONDAY, NOV. 11th – HAIRCUT – 11:30 AM . . . and such could be the calendar of any jeweler or watchmaker. Please note that professionalism is displayed not only by the doctor, but by automobile specialist and the cosmetologist. Specifically, they insist that everything be done by appointment.

To a degree, jewelers' customers, especially special showings, can and should be controlled by special appointment. But for the most part, we must be at the ready for the revolving door. Our existence is dependent upon being available to our customers.

As we think of it, we too are customers, and much abused customers at that. Many salesmen have the habit of appearing at your store when they decide it is most opportune for them. They expect the jeweler to give of his time no matter what his schedule may be.

One store owner explained how he handled surprise visits. He asked what goods the salesman handled. If he was not in the need of those goods he simply told him so and firmly excused himself. But if the jeweler was interested in what the salesman had to show, he told him that he should not waste all that time traveling to his store just for an appointment. Please use the telephone to save himself time.

The owner explained that even if he had the time to examine the salesman's line, he never would on a cold call. He said he didn't want to ruin a procedure that was already working very well.

ON THE FRONT: *The rugged beauty of Mount Jefferson rises above Bays Lake on our cover. Note the Bear Grass in the foreground. The scene is part of the Mount Jefferson Wilderness Area in Oregon. Photo by Theodore S. Fleming of Eugene, Oregon.*



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PRESIDENT'S MESSAGE...



Still Alive and Kicking!

Fred S. Burckhardt

The *Hoosier Horologist* printed an article supplied by Orville R. Hagans concerning a watchmaker in England. There isn't room to print the whole article, so I'm going to condense it. It should be an inspiration to watchmakers everywhere.

Mr. Paul Nesbit started this "one man in a cupboard" company in December 1981. He now has a staff of 15 and expects to increase the number to 25 or 26 this year. In 1984, the company had profits of nearly $100,000 and could well double that figure this year.

Why has this company been so successful? According to Mr. Nesbit, "I wanted to set up an old-style repair service where the customer comes first. Jewelers don't know as much about watches as they do their own products. They really don't care about that side of the business, so the customer's trust in the jeweler for repair is lacking."

Mr. Nesbit's company, Mistal Time Services, tries to spread the knowledge of watches and watch repairs among jewelers through one-day seminars held in the Spring and Autumn.

According to Mr. Nesbit, "People say that watch repair is dying, but we believe that it is a very important part of the jewelers' service. We're proving that the art of watch repairing is still alive and kicking."

As far as the future is concerned, Mr. Nesbit's ambition is, "We are going to be the number-one independent watch repairer in the U.K."

I don't know about you, but I think he'll make it.

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Questions & Answers

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Bells That Won't Cooperate

Q I have a Gilbert movement that appears to have been modified to strike on a coiled wire gong. The movement mounts and case appear to be original. The screw holes in the case line up with mounting lugs on the amplifying box. The hammer bracket could have been mounted on the bottom of the movement plate; the holes line up. I'd like to restore it but have no idea how the bells were activated. Can you help?

John S. Keller
Hampton, Virginia



A *A search through my Gilbert clock catalogs shows two tall case clocks, almost identical with spring-wound movements and chimes which struck on the hour and half. These are clocks numbered 23 and 24, 7 feet 6 inches, retailing for $55 and $65. They evidently had the same movement. These are the model of your clock. The chime probably was on the bell system originally, as shown in your photo.*

From your photo it would suggest that like the Seth Thomas Sonora, there was a separate drum activated movement below the bells which tripped the bell hammers much like a pinned music box. The upper movement merely supplied the release power to the powered, separate musical train below.

Perhaps writing to the American Clock Museum at Bristol, CT would help as they might have a copy of the patent which could show the chiming arrangement.

Q The following is a question to which I have heard several answers. Now I, too, want to do something.

I have a clock in which the pendulum in its swing does not appear in the glass. What can be done?

1) A practical application that is positive, to change a gear, which or what one to increase or decrease the pendulum length?

2) Changing the center of gravity by weight and where and when to apply.

Thanks for your help.

Ed Sullivan
Lynbrook, New York

A *You'd be surprised at how often we receive a question such as yours. So many collectors and dealers who buy or match up cases in stock with stock movements have no real regard for the aesthetics or the importance of finding a movement whose pendulum length will allow the bob to be seen through the aperture in the bottom of the case front. This for the reassuring appearance that the clock is running and for the pleasant swinging of the pendulum's bob gaily swinging in its "window."*

This can be solved a number of ways, the last resort being to supply a different wheel count to make the pendulum bob hang lower or higher (you don't mention which in your letter).

Suppose the pendulum needs to be longer for the bob to appear. There are two ways this can be accomplished, yet the clock keep time. One is to supply a mock pendulum bob, extending the rod. The mock bob should be very light, merely a shell. This normally, as light as it is, will make the clock go slower. To compensate, merely raise the real bob until you have struck a time balance. Some clockmakers who wish to please the customer and who don't want two apparent bobs to confront the customer satisfy the situation by removing the original heavy bob and substituting a lead elliptical streamlined bob which blends with the rod or a turned brass ornamental piece–this takes the place of the original bob.

If the pendulum bob is below the aperture also, supply a light, shell bob above the original one and lengthen the bob to compensate. One of the most

(Please turn to page 35)

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Bench Tips



Joe Crooks

To Glue or Not to Glue

. . . That is the Question

This month's tip is from Mr. Hubert Warr of Nashville, GA.

Joe, I've found something that is out of this world for cementing the case tube to the case of a waterproof case's hole. It sets up in a few minutes and is better than anything I've ever used. You don't need heat to set it up. Only 20 to 30 minutes, and it's a real bond. It is LOCTITE® Lock 'n Seal Threadlocker, Part # 24200, medium strength. You can buy it at any automotive parts place. It is especially good for the tip end of optical screws to keep them tight. It's been a real timesaver for me.

Hubert, back when the first automatic watches came out and the clutch springs were so strong that the automatic winding would unscrew a tight crown from the stem, I used LOCTITE® to bond the stem and crown together. Now I use crystal cement epoxy like the manufacturers use–but I never have trusted any type of cement to hold in a loose case tube. If the watch is dropped on the crown or the crown has a sharp blow sideways, it will break the cement loose from the case and tube every time.

The only way to fit case tubes is a tight-friction fit. In the October '77 H.T. issue, we showed how to make a tool to friction-fit tubes without damaging them (page 53-54).

If you are using the tube that came out of the case, it can be stretched with the tapered end of the tool on the staking tool over the proper hole for a friction fit in the case. Then place the tube on the shoulder of the tool and drive it in the case without damage to the tube.

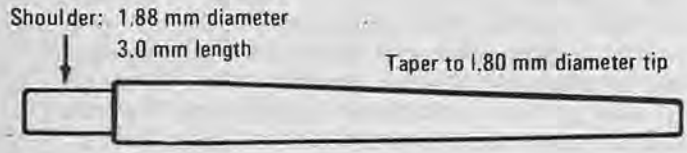
To replace with a new tube, select one that is a wee bit too tight and taper it slightly in the lathe, then drive it in the case with the tube tool for a strong friction fit. If you want to try cementing (or epoxying) a tube to the case, make sure the parts to be glued are extra clean to make a bond, and remember this: slow hardening epoxies are stronger than the fast-drying types.

I'm like the woman who soaked a can for three days and tried every way she could to get a coupon off the can for a free gift. I don't want the free gift–just tell me where I can buy some of that glue!!

Send your tips to: Jingle Joe, AWI Central, 3700 Harrison Ave., Cincinnati, Ohio 45211.

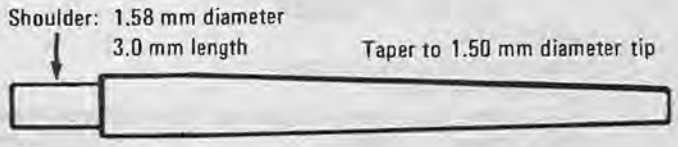
TIMES

TOOL FOR 2.5 mm TUBES



Material: 2.50 mm diameter staff wire, 30.0 mm long

TOOL FOR 2.0 mm TUBES



Material: 2.00 mm diameter staff wire, 30.0 mm long

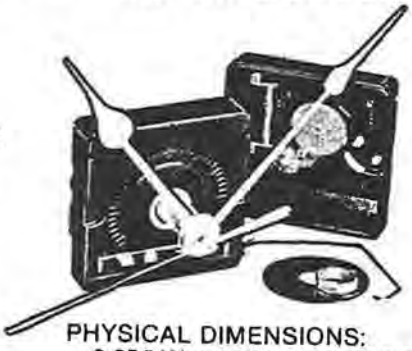
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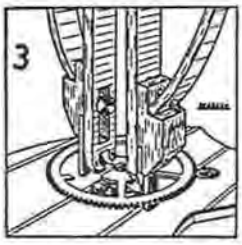
MAY COMBINE DIFFERENT SHAFTS

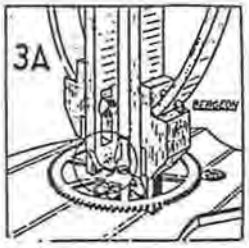
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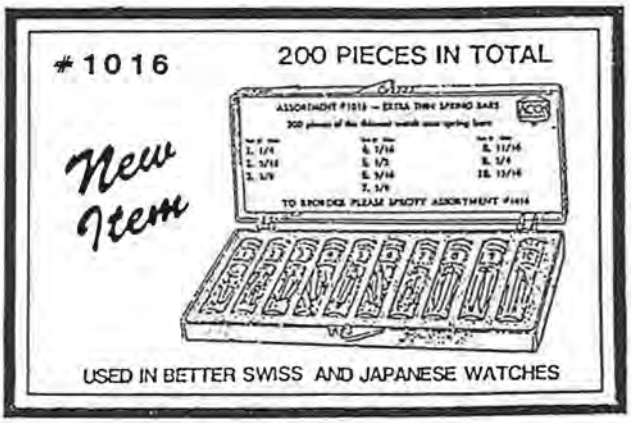
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PART V

INTRODUCTION TO FILING

The purpose of filing is to reduce the size and change the shape and finish of an article. Mastering the skill needed in using files takes years of practice. The art of filing takes a combination of sight, feel, and sound. One must be able to observe the action of the file and also feel what the file is doing. The sound that is produced when the file is being used gives a clue as to whether the file is cutting the metal smoothly or not. A chattering sound could mean that the file is too coarse for the thickness of the material being filed or that the metal is not fastened in the vise correctly. Too much pressure on the file can also cause a chattering sound. Feeling what a file is doing can determine if the file is cutting or just sliding over the material being filed. If the file has a jerky motion, it is a good indication that the teeth of the file are clogged with chunks of metal. If the file slides over metal without biting into the metal, chances are the teeth of the file are dull or perhaps the file is too fine for the job. When filing, the file must be observed to see if it is level or square with the metal; otherwise, the surface will not be filed flat or square. A mental picture must be formed of the article as it is before filing, during the filing, and what the article should look like when it is finished.

There are three methods used in filing: 1. Straight filing, 2. Cross filing, and 3. Draw filing. STRAIGHT FILING is used to remove excess metal quickly; CROSS FILING is used to flatten the surface by removing high spots; and DRAW FILING is used last to remove high spots left by CROSS FILING and to finish the surface.

When doing straight filing, the file is moved straight across the article to remove material quickly. In this case, the surface may not be flat when the excess material has been removed. Therefore, other methods must be used to flatten the surface and to finish the surface to size. Cross filing is used to flatten the rough filed surface. Cross filing is a method of filing where the file is moved across the previously filed surface at a 45° angle to the surface. Then the file is moved across the surface at right angles to this direction. In other words, the file marks cross each other which helps to assure a flat surface. The file direction is alternated from one direction to the other until the surface filed is flat as indicated by placing a straight edge on the surface. Draw filing is used after straight filing and cross filing to bring the article to final size and finish. When draw filing a surface, the file is held on the surface at right angles to the surface. Both hands are used on the file to hold it and to draw it back and forth on the surface lengthwise of the surface. The file is held with one hand on each side of the article being draw filed. The thumb and index fingers of each hand should be about 3/4 inch from the article being draw filed.

A file is designed to cut on the forward stroke only. The required pressure is placed on the file so it will cut on the forward stroke and the pressure is released on the return stroke. The file should be raised slightly from the surface on the return stroke. Dragging the file on the return stroke could damage the teeth of the file, especially when the metal is somewhat hard and tough. The only exception to this is when filing soft material such as lead. In this case, dragging the file on the return stroke helps to keep the soft metal from clogging the teeth.

The file should never be used on hard metal. This causes the teeth to be damaged which makes the file practically useless. When breaking in a new file, it should be used on brass first to condition the teeth before using it on steel.



Figure 1



Figure 2

Never use a file without a handle because there is danger of running the tang of the file into the hand. Also, it is difficult to use the file without a handle. When using the file, too much pressure can damage the teeth of a file. Sliding the file on the material without the teeth cutting can also damage the file. After a file has been used on steel, it is no longer the best for brass. When filing blue steel, an old file should be used for removing the excess material, then a better file can be used for the finish filing. When using a file, if some teeth should break off into the metal being filed, the broken teeth must be picked out of the metal; otherwise, any file used on the metal will be damaged by the broken teeth. A file should never be wiped with the hand or fingers; use a brush to clean it. The pressure needed on a file when being used varies with the coarseness of the file and the area being filed. A coarse file requires more pressure than a fine file. A broad surface requires more pressure on the file than does a narrow surface. A coarse file is used for removing material rapidly on broader surfaces. Files of medium coarseness are used on more narrow surfaces for average material removal and finer files are used for finishing work. When using hand files and files of equivalent size for roughing out in removing excess material, the operator should work in a standing position with the material held in a bench vise. When using smaller files such as needle files and escapement files where very little pressure is needed, the operator should be seated at the bench.

When using a bench vise which has serrated jaws to hold articles being filed, the jaws of the vise should be lined with sheet copper or sheet brass to protect the article being held in the vise. Thin cardboard can be used to protect the article instead of using copper or brass.

USING THE FILE

When holding an article to be filed in the bench vise, the vise should be at elbow height when the operator is standing straight. This is so the file can be carried level across the article being held in the vise for filing. Figure 1 shows an article being filed which is held in the bench vise. This illustration also shows the correct position of the hands on the file. The right hand is holding the handle of the file, and the index finger is on top of the file pointing straight toward the end of the file. The end of the file is being held between the thumb and the index finger of the left hand. Note: For a left handed worker, the hand positions are naturally reversed. The hand holding the handle is the hand that does the pushing when the file is cutting, and the hand at the end of the file does the guiding of the file. Note: The strokes of the file should be as long as possible. Short choppy strokes should be avoided. The operator should have a firm grasp of the file handle but be relaxed when filing. It is difficult to file flat if not relaxed. Metal being held in a bench vise for filing purposes should not extend more than 1/8 inch above the top of the vise jaws; otherwise, the file could chatter on the surface.

When filing a surface that is longer than the file is wide, like the one shown in Figure 1, the operator should start at one end of the surface and use the file across the surface, then move the file to a new position for the second stroke which slightly overlaps the first position. This procedure is repeated until the whole length of the surface has been filed. Then the surface is filed toward the starting end by overlapping the strokes in the same manner. This pattern of filing is repeated from one end of the surface to the other until the article is brought almost to size, then the surface is cross filed and draw filed to size. The reason for overlapping the file positions when filing a long flat surface is to help maintain a flat surface during the straight filing operation. Any burrs created on the corner of the metal during the filing operations should be removed with a FILE and NOT WITH THE FINGERS. A burr can cut the fingers. To remove a burr, the file is moved down the corner of the metal lengthwise of the metal until the burr drops off of the corner of the metal. Another safety rule is: Don't leave metal in a bench vise unattended. You and others may become injured by this carelessness.

Figure 2 shows how to hold a file for draw filing a surface after it has been roughed down almost to size. When draw filing, the file is held flat on the surface and is moved back and forth over the surface from one end to the other, keeping the file level on the surface. It is very important not to let the file slide off of the ends of the surface. If this happens, the ends of the surface will likely become rounded off causing the draw filed surface to be out of flat. The length of the file is kept at right angles to the surface being draw filed. The file cuts on the forward stroke only; therefore, the pressure is applied on the forward stroke and no pressure is needed on the return stroke. The file can be brought back with a light pressure on the surface on the return stroke in order to help keep the file level on the surface.

Figure 3 shows a wheel being held in a bench vise for filing the spokes after the wheel has been crossed out with a jewelers saw. The wheel is being protected from the vise jaws with a piece of thin cardboard on each side of the wheel. Since the wheel is made from thin brass, a fine cut file is being used to file the crossings. The file being used as a Number 4 cut. Thinner wheels may require a Number 5 or 6 cut. This is to avoid bending the wheel when it is being filed.

The teeth of a coarse cut file tend to catch on the thin brass which is likely to bend the metal. Selecting the cut of a file is somewhat like selecting a jewelers saw blade. For smooth sawing, the blade should be of such a size that at least three teeth are in contact with the metal at all times. The more teeth of the file that are in contact with the metal, the smoother it will file. When filing the inner part of the wheel rim which has a concaved shape, the file can be a half round shape or a crossing oval shape. The shape of the file used should conform as much as possible to the shape of the inner part of the rim. The action given the file when filing a concave surface such as this should be as follows. The file is pushed straight forward but at the same time the wrist of the hand holding the file handle is given a twisting motion. This causes the surface being filed to have a smooth uniform curved shape. The twist of the wrist is in a counter-clockwise direction when filing toward a spoke on the right and in a clockwise direction when filing toward a spoke on the left. In other words, the file is turned on the metal at the same time as it is being pushed on the metal.

Figure 4 shows how the crossings are draw filed. The file is held on each side of the wheel blank close to the blank. It might be desirable to use a smaller file such as a needle file to do the draw filing on wheel crossings. A smaller file gives a longer stroke when draw filing.

Figure 5 shows how a wheel can be supported on a piece of cork on top of the bench while the crossings are filed. The cork prevents the teeth of the wheel from becoming damaged. The wheel can be supported the same way for draw filing.

Figure 6 shows three vises that can be used on top of the bench to hold articles for filing. View A shows a small drill press vise, View B shows a large toolmakers steel clamp, and View C shows a small toolmakers steel clamp. These vises are excellent for holding small articles while they are being filed. Since these vises are used on top of the bench, they can be moved anywhere on the bench and turned to any position. Some of these vises have a hole in their bases so they can be screwed down to a board or a bench top.

(Please turn to page 22)

Figure 3



Figure 4



Figure 5

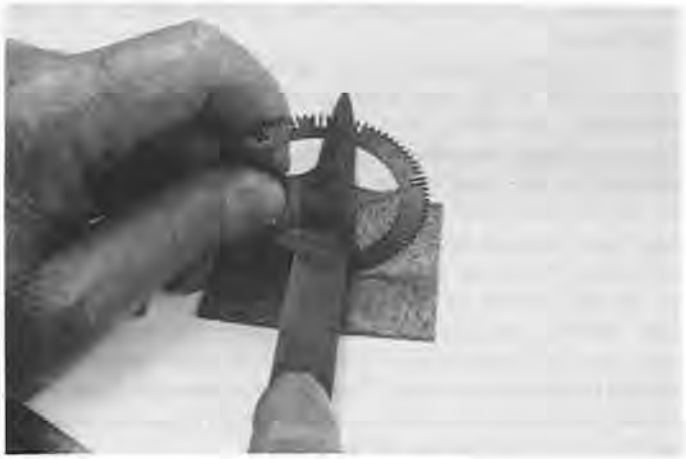
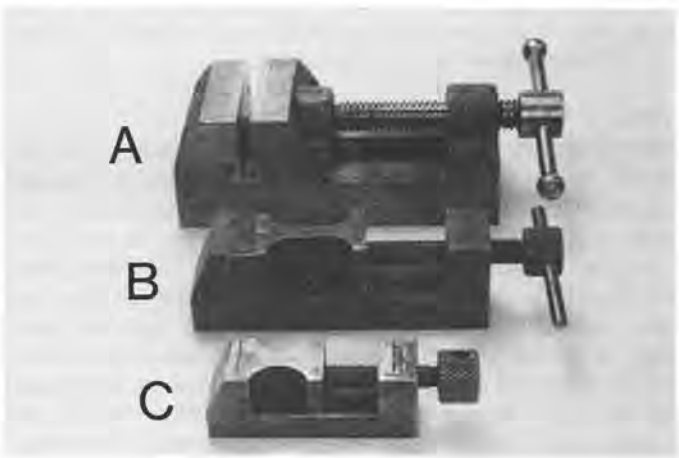


Figure 6



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Elizabeth Brehmer

Fancies With Points

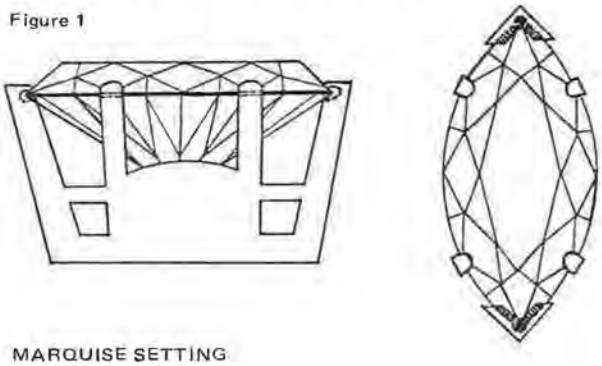
After practicing and becoming proficient at setting four and six prong ring heads, the next step is to go on to a more complex and advanced form of setting. Setting fancies (fancy diamonds) which have pointed ends can prove to be a new and enjoyable challenge. The shapes vary, there are pear shapes, marquises, hearts, triangle (known as trillion), and baguettes. All of the former will be discussed except the baguette-shaped stones. They will be discussed in a later article. All of these shapes have ends or points which must be specially treated when setting.

The pointed cut stones are probably the most expensive and most difficult to set of all the types of diamond cuts. They are also the most fragile and have very sensitive tips.

The primary concern in setting any of these stones is cutting the proper seat and accommodating the points of the stones. A void is always cut in the end prong (Figure 1) in order to accommodate the tip point of the stone. Most prongs that hold a tip are shaped in a V shape, some however can be round or square. The most desirable shape is the V-shaped tip. It is much more stable and secure. The V shape will protect the very end of the stone. This way the wearer is less likely to break off the tip of the stone.

Several types of burs can be used to create a void in the V prong. Probably the most common bur used for this purpose is the ball bur. However, a bud bur will do the same job. In a pinch even a drill bit can be used to bur the hole. If using a drill bit, use the proper diameter so that it will allow enough space for all of the tip of the stone.

Figure 1



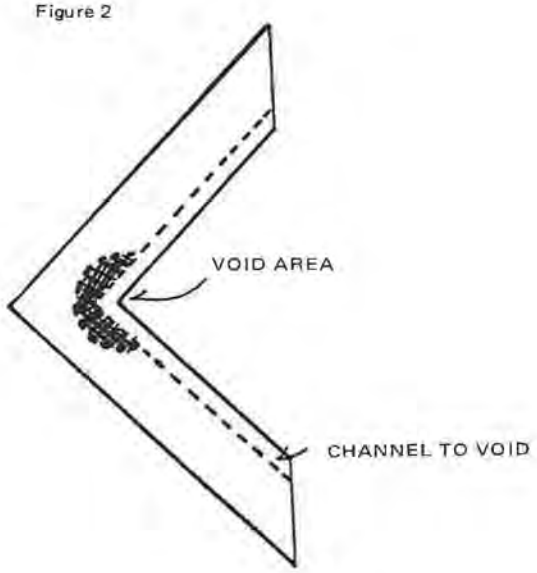
MARQUISE SETTING

To choose the proper diameter bur for cutting the void, look at the girdle of the stone where it meets at the point. The seat is the most critical area to keep an eye on. Note the thickness of the girdle and the angle of the pavilion facets. The area where they meet is the size that the void must be. Very thick girdles and flat blunt points require larger openings to accommodate their size and volume. Thin girdles and sharp, long tapered points will take a smaller seat. The hole left by the bur must be large enough to keep the tip suspended with metal above and below it without any of the metal touching it anywhere.

Before setting any of these fancies, check the following:

1. All prongs should be the same height.
2. All prongs should be straight and properly spaced.
3. Check stone very carefully for any bad internal/external flaws (especially ones that extend from the inside to the girdle edge). Look for nicks and chips on the surface.
4. Check the girdle of the stone: note whether it is a knife edge or a thick girdle. The seat must be cut according to that stone's shape.

Figure 2



5. Check the head to make sure that it is the proper size and that it covers all the critical areas of the stone.
6. The head should be prepolished before setting the stone.

Once these points have been checked, then take a pair of dividers and mark a seat line on each of the prongs. The marks should be made on the inside of the prong so they can be seen while the cutting is taking place. Make sure that you allow enough extra metal so the prong can be properly pushed over the girdle of the stone. The side seats can be cut with a 90° ∠ bearing bur. They should be cut no deeper than 50% of the total thickness of the prong. One-third of the prong thickness will be seat, two-thirds will remain to be pushed over the girdle. In choosing a bur to cut the side prongs, find one that is just large enough that it will not fall between the spaces in the prongs. If it is too small it will grab on to the edges of the prong and run around it chewing up the prong on all sides.

The next step is to cut the seats for the tips of the stone. It is important to properly prepare the prongs at the ends to accommodate the pointed shape (Figure 2). Take a ball bur (at least the size of the tip of the stone end) and bur a hole centered on the scribe line. The hole should be approximately two-thirds of the way into the prong. This creates a void for the point of the stone. A drill bit will also work, but the hole must be drilled straight in, not at an angle.

Once a void has been burred in the center of the V prong, take a bearing bur small enough to cut one side of the prong and run a channel on each side of the burred hole. Match the channel into the void. The marquise will seat in this channel and the very tip will seat in the center of the void. The tip should touch no metal, but be held on each side by the channels.

When the V's have been burred to accommodate the tip of the stone, place the stone in the seats to check for levelness and fit. In some cases the marquise will not seat properly in the V's because of extra metal (due to thick prongs) touching the pavilion facets of the stone. In some instances it will be necessary to take a small ball bur and run a channel down the center of the V prong from the void down the inside of the prong (Figure 2). The channel should be smooth and blend evenly with the burred void. This particular problem usually occurs when using a marquise head that has only a V at each end and no side prongs to hold it in place on the sides.

The next step is to set the stone by using the four side prongs. Equalize the space between the prongs and center the stone tip on the end prongs. Check for levelness and straightness. All adjustments should be made now before the stone is finally tightened in place. There are several ways in which the points can be tightened in place. The first way is to find the center of the V and cut straight down into it using the finest saw blade available (an 8/0 is the best choice). The cut should be made as deep as the top of the girdle of the stone. It is very important to make sure that the cut is made straight down the center; if it is made crooked it will show from the outside. After the cuts are made on both ends, take a burnisher and burnish each side of the V in toward the crown and over the girdle of the stone. At this point the stone should start to tighten in place.

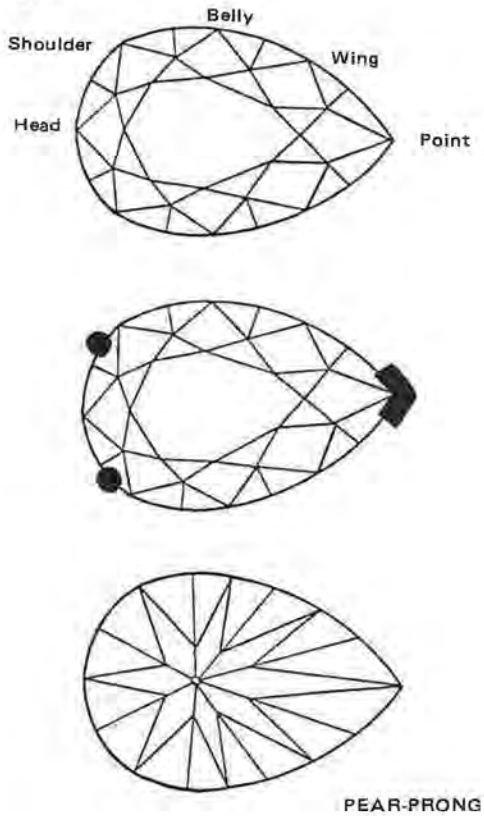
Another option is to take a pair of pliers and lightly pinch each side of the V until the channel fits tight into the girdle of the stone, then take your prong pusher and lightly push each side of the V parallel with the crown of the stone. Make sure that the prong is tight against the crown of the stone.

For filing up the tips use a number six cut barrette file (needle file). Pass over the top of the V prongs enough to flatten the top and make the surface plane level. The next step in filing is to bevel each side of the V at about a 45° ∠. The bevel should angle from the top of the prong to about a quarter of the way down the prong. A very small flat area should remain on the top of the V. The flat area keeps the V from having a knife edge close to the crown of the stone, and the V from snagging on anything. The side prongs should be filed to one-third the crown height and filed and rounded up the same way as a four prong ring prong.

When setting a pear shape stone (Figure 3), the same basic technique should be used. Scribe the seat marks on the inside of the prongs. Most pear shape heads consist of three prongs—the center V prong and two back round prongs. The two back prongs hold the stone into the V and tighten down on the crown. In some cases, when setting color stones the V will be replaced by two small round prongs which will hold the tip or nose of the pear shape on each side. These prongs are marked and cut in the same manner as previously explained. The biggest disadvantage to this type of setting is that it leaves the tip of the stone exposed and susceptible to breakage. The same steps must be followed in setting and cutting a seat for a pear as when setting a marquise stone. Remember to check the thickness of the nose of the stone where the girdle and the pavilion facets meet. That area is the one which must be considered first when cutting the V prong.

The inner edge of the V can be cleaned up and trimmed with a number 40 flat graver or a number 50 round bottom graver. Trim off the extra metal flash. The graver should leave a good clean bright finished edge next to the stone. A light rouging will finish off the tip.

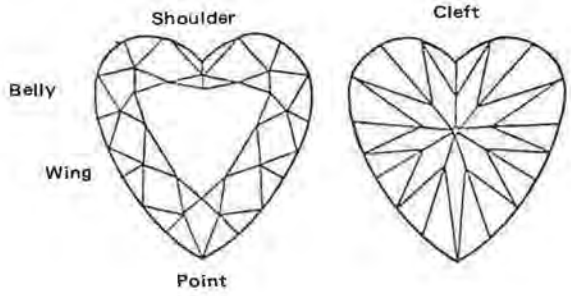
Figure 3

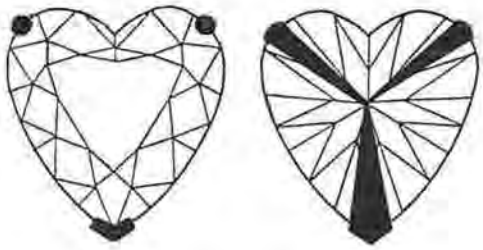


PEAR-PRONG PLACEMENT

There is little difference in setting a heart shape (Figure 4) and setting a pear. Probably the most outstanding contrast is in the depth of the pavilion facets. The heart shape stone is usually cut quite deeply, especially below where the two upper curves meet. The head styles for a heart shape can vary. The most common is a wire base head. The head has a wire frame that is heart-shaped and a smaller heart shape below. The two shapes are held together by wire prongs attached to both.

Figure 4





To seat a heart shape in a wire head, take a bud bur and put a 45° ∠ on the inside of the top of the top wire. This will accommodate the pavilion as the seat. Mark the prongs with your dividers and cut the seats for the girdle of the stone. Usually with these wire heads there is a problem with the stones' culet not seating properly. The upper wire heart shape comes to a sharp point where the two curves meet. This point needs to be ground away in order to allow the culet to pass by and the stone to seat properly.

Pear shape five prong heads can be adapted to accommodate the heart shape stone; the heavy tip prong is still used for the point of the heart. One prong sits in the center of the curves and the other two prongs hold the back of the heart. Be careful in modifying the head. The back prongs can be short, especially if the stone is heavy girdled or heavy bodied. The heart shape will sit low in this head (Figure 5).

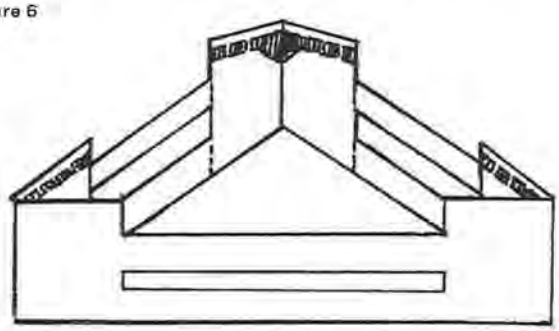
Figure 5



TRILLION SETTING
PRONG PLACEMENT

When setting a trillion (triangle shape) caution is needed in cutting the seats for the points. The seats are all going to be cut to accommodate all points, and each point is going to require a void. There are several head styles available for setting trillions. One is a wire head and has round wires in each of the corners. The other is made from square stock and has V prongs on all three ends. The V prongs are prepared the same way that the tip Vs of a marquise are done. Bur into the center to make a void and undercut along each side, matching the grooves into the void. Equalize the pressure as you tighten the prongs into the stone tips. Trim off the extra height and shape accordingly. The tip metal on the prongs of the trillion setting are going to be quite thin (Figure 6), probably much

Figure 6



thinner than the average jeweler is accustomed to. So keep this in mind when you are tightening this metal into the stone. Use a burnisher rather than a set of pliers. Pliers will make deep marks in the metal and they will be difficult to remove without making holes in the prongs.

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Watchmakers from three states were in attendance. They included: Grover Brown, Yakima; Frank Ecker and Dick Gaab from Spokane; William Gaebe, Coeur d'Alene; Richard Hubbard, Spirit Lake; John Hughes, Sr., Orofino; Jerry Jackle, Moscow; and Terry Waller, Harvard, ID; Woodrow Boyd, Deer Lodge, MT; and Leo Lukes, Great Falls, MT. The event was hosted by Tom Imai, CMW, CEWS, of Spokane, WA.

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The writer would like to share with his fellow watchmakers the experiences gained through participation in many programs of education including lectures and demonstrations, along with classroom and laboratory instruction, involving both theory and practice. This work approaches that of the watchmaker or any other professional requiring learned skills. The learning process is the same; only the content may differ in whole or in part.

The training required for the practicing general watchmaker involves a knowledge of such subjects as escapement types, their advantages, disadvantages and adjustments, wheels and pinions, their relationship to each other in the time train, and the under-the-dial train, setting and winding mechanisms, among others. To restore complicated watches will include many additional bits of information. How and where can this information be found?

Let us bear in mind that during our watchmaking training, we had learned from lectures and reading information deemed important by the instructors of our respective schools. At the same time we were shown by demonstration the best way to approach a mechanical problem, followed by our own participation in the process. We learned first how to use hand tools, followed by machine tools, including at least the drill press, the watchmakers lathe, and perhaps, later, the use of wheel and pinion cutting engines. We cut arbors with their pivots, fitted collets for wheel attachment, and learned how to make and fit parts not ordinarily obtainable from supply houses, becoming watchmakers instead of parts replacers only. Or we should have learned these techniques!

In order to restore complicated watches, antique watches, and those having very unusual mechanisms, we need to have learned, or be willing to learn, certain additional sophisticated machine shop practices. We need to have available sources of information in the form of books, periodicals, research papers, schematic drawings, and other forms of specific information. This need has been expressed to the writer by many persons who have read the articles published concerning the restoration of two of the watches comprising the AWI Packard Collection. That this need is felt by clockmakers as well is evident by the questions raised by those who have attended the seminars taught by the writer over the past several years.

Hopefully, this article will help to answer some of the questions raised. First, we must have access to sources of information beyond that found in standard teaching texts. We will begin with a listing of some books found in the writer's library, followed by a brief description of the content of a selected few as they would apply to the restoration of complicated watches.

A BIBLIOGRAPHY OF COMPLICATED WATCHES
(Selected References)

* * * * * * * * * *

HISTORICAL
(Makers, dates, geographical)

WATCHMAKERS AND CLOCKMAKERS OF THE WORLD.
G.H. Baillie. NAG Press, Ltd., London. 1963. *(Note: Listings to 1825.)*

WATCHMAKERS AND CLOCKMAKERS OF THE WORLD.
Brian Loomes. Volume 2. NAG Press, Ltd., London. 1965. *(Note: Extended to 1870, with additions and corrections to the first volume.)*

WATCHES.
George H. Baillie, C. Clutton and C.A. Ilbert. Bonanza Books. 1965.

BRITTEN'S OLD CLOCKS AND WATCHES AND THEIR MAKERS.
George H. Baillie, C. Clutten and C.A. Ilbert. Bonanza Books. New York. 7th Edition. 1956.

COMPLICATED WATCHES
(Types, variations, features)

COMPLICATED WATCHES.
Translated, compiled and edited by Emanuel Seibel and Orville R. Hagans. The Roberts Publishing Company. Denver. 1945.

COMPLICATED WATCHES AND THEIR REPAIR.
Donald deCarle. Bonanza Books. New York. 1979.

A GUIDE TO COMPLICATED WATCHES.
Francois LeCoultre. Charles Rohr, Ltd. Bienne, Switzerland. 1952.

TECHNICAL BACKGROUND

PRACTICAL BENCHWORK FOR HOROLOGISTS.
Louis Levin and Samuel Levin. 7th Edition. Louis Levin & Son, Inc., Los Angeles. 1948.

TREATISE ON MODERN HOROLOGY IN THEORY AND PRACTISE.
Claudius Saunier. W. & G. Foyle, Ltd. London. 1975. *(First published in 1861.)*

CLOCK AND WATCH ESCAPEMENTS.
W.J. Gazeley. Newnes-Butterworths. London. 1956.

WATCH AND CLOCK ENCYCLOPEDIA.
Donald deCarle. Bonanza Books. New York. 1977.

WATCH AND CLOCKMAKING AND REPAIRING.
W.J. Gazeley. Heywood Books. London. 2nd Edition. 1958.

BRITTEN'S WATCH AND CLOCKMAKER'S HANDBOOK.
Revised by J.W. Player. E. & F.N. Spon, Ltd. London. 1955.

THE ART OF BREGUET.
George Daniels. Sotheby Parke Bernet. London. 1975.

(Note: Most of these books are available to members through loan from the Library of the Education, Library and Museum Trust of the AWI.)

A brief evaluation of selected books from the preceding list may serve as an encouragement for the watchmaker interested in the restoration of older, unusual and complicated watches.

HISTORICAL

The writer has made it a practice to inform the owner of a watch concerning its age, maker and country of origin of that timepiece in addition to general details of the movement itself. Very frequently the owner has limited information, not always correct, but handed down through the years as the watch was a part of the family history. The first two books listed under the historical section contain voluminous information, but the second two have excellent illustrations, in addition. With this interest on the part of the watchmaker, the owner has a feeling of greater assurance that every attention will be given to the work to be done, as well as an appreciation for an authorative statement on the history of the watch.

COMPLICATED WATCHES

These three books illustrate, describe, and offer suggestions for the repair of complicated watches, yet all three augment each other in terms of approach and content. LeCoultre's *A Guide to Complicated Watches* covers such areas as independent seconds-beating movements, jumping seconds watches, chronographs, simplified chronographs, minute recording mechanisms of several types, repeating watches, recent and older, clock watches, perpetual calendar watches, continuous type, instantaneous and retrograde types, and equation watches, with a table showing the equation of time. It would be the watchmaker's choice in selecting a book to assist with the restoration of complicated watches; all three listed are excellent. These books have a running commentary well covered with line drawings, and with special suggestions for repair.

TECHNICAL BACKGROUND

Levin and Levin, *Practical Benchwork For the Horologist*, is an excellent book for a review and an expansion of the watchmaker's capabilities in the shop. In the restoration of complicated watches we frequently find parts missing, broken, or having been improperly repaired at an earlier time. Replacement items for these watches are no longer available, and making a part means the difference between turning down a job or adding to the shop's income, and prestige (as one able to do unusual work). Of course, a happy customer takes home a restored and valued family heirloom.

Gazeley and deCarle are well known to watchmakers, but *Britten's Watch and Clockmaker's Handbook* and George Daniels' *The Art of Breguet*, are replete with information of value to complicated watch repair. What with drawings, tables and descriptive material, these are a must in the shop.

One area not covered in this article but found here and there in some of the references relates to metals, solders, and techniques of fabrication of parts. Carbon steel stock, rod, plate, wire, either hardened, tempered or annealed, is used for making such items as arbors, pivots, pinions, balance staffs, stems, levers, and small springs. Medium soft and hard brass plate, and hard brass wire, are required for making numerous parts such as wheels and springs, among other items. A knowledge of how to harden and temper and anneal steel, as well as the use of soft solder (such as 60% tin and 40% lead), hard solder (such as silver solder, 1175 degrees Fahrenheit) should be knowledge already available, or found in source books in every shop.

With this brief encouragement, hopefully the interested watchmaker can find excitement, and profit in servicing a field that has been neglected of late.

The next article will be on "The Care of, and Precautions to be Taken in Handling Complicated Watches."

THE PICKLE BARREL



Marshall F. Richmond, CMW

Handcrafting Earrings

Handcrafting jewelry is not usually practical. This is due largely to the fact that manufactured items are so easy to obtain and they sell at a good profit. However, there are many reasons to handcraft jewelry where money is little or no object . . . and then it can become highly profitable.

Many people have stones or other objects that have great sentimental value and they wish to have them made into jewelry pieces using usually karat gold—even platinum. Some people in their travels purchase loose stones and want them made into jewelry pieces. Many of these stones are not standard cuts or shapes, so no mountings or settings already manufactured are available. A combination of handcrafting using basic materials or using manufactured findings can be used and a one-only piece can be created using the customer's own ideas.

POST EARRINGS

Earrings are made in many styles and attachments. Simple pierced post earrings are probably the simplest piece of jewelry that can be handcrafted. Post clutch back tie tacks are equally simple to make. Pierced earrings can be made with posts having clutch or screw backs, the posts attached directly to the earring, or made with a small ring and a dangle or drop attached. Kidney-shaped earwires with a ring attached or bent into the wire can be used to attach drops or dangles.

There are many types of fastenings for unpierced ears. There are screw backs, clamps with a spring action that keeps a constant pressure on the ear lobe, and I have even seen hooks that hook over the ear with dangling ear drops. Most clip or snap-type earwires for nonpierced earrings are available from the material distributor or findings house, with a ring for drops or with a concave place to cement stones or soft solder on the back of metal pieces used to ornament the ear lobes.

Stones like jade, turquoise or agate are often in such sizes and shapes that bezels or settings must be made to hold the stones. Then they can have any type of fastening for the ear attached to it.

MAKING AN EARRING WITH A ROUND CUT STONE

Since the most common earring today is the pierced post with a clutch back attached direct, I will give a step-by-step description on how to make one using a round cut stone. This can be made completely with manufactured findings or by making the posts from .8 mm 14K white or yellow gold wire. First, the components must be selected (Figure 1): two clutch backs (A), two stone settings (B), one piece of .8 mm 14K gold wire (C), or two manufactured posts (D). If using the wire, the grooves close to the end can be cut with a small tapered round needle file. Or if a watchmakers lathe is available they can be chucked in a Number 8 chuck and the grooves cut with a graver.

To file the groove, chuck the wire in a pin vise and rotate while filing on the filing bench pin. While still in the pin vise the ends can be polished smooth since they are more difficult to hold after the earrings are assembled. With the grooves for the clutch backs cut in each end, the wire can be cut in the middle with the jewelers saw, making two posts each (10 mm long). Since most settings as pictured have a hole

FIGURE 1

A - Earring Clutch Back

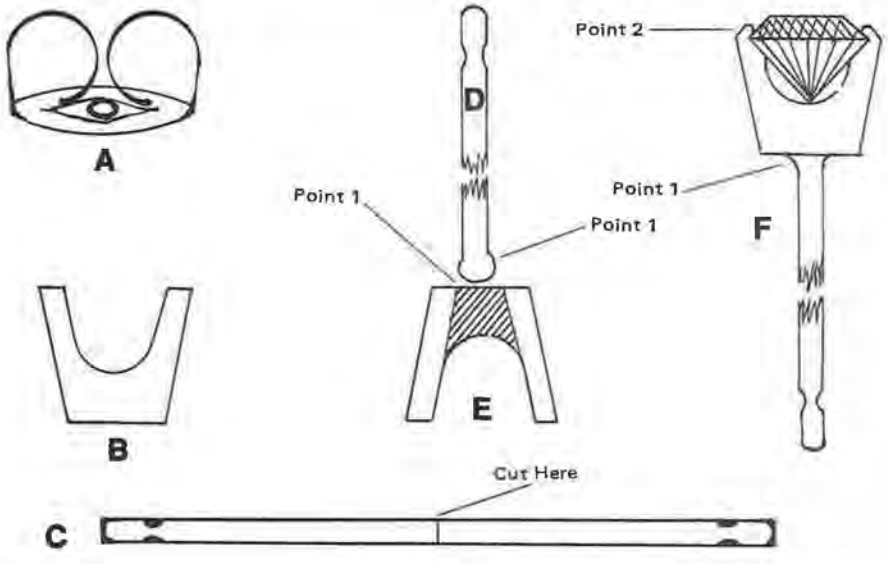
B - 14K Setting for 3mm Round Stone

C - .8mm 14K Wire 20mm long

D - Post Completed For Soldering

E - 14K Setting - shaded area indicates hole from bottom

F - Finished Earring



in the bottom larger than the wire, they can be closed by melting a small piece of scrap gold–such as has been removed from a ring in sizing. This can be done by placing it on the asbestos soldering block or charcoal block, fluxing, then heating until it melts, forming a small sphere (ball). This ball should be large enough not to go through the hole in the bottom of the setting. The setting can then be placed in the soldering pad with the prongs pushed into the pad which will keep them from melting if too much heat is applied. The ball can then be placed on the hole, fluxed, a piece of fluxed solder around the edge, and then heated until the solder flows. While the setting is still in the soldering block the posts can be attached by gripping the post with the locking heavy duty tweezers at the notch for the clutch back, applying flux and fluxed solder to the other end which is to be attached to the setting. Heat until the solder flows, forming a ball on the end of the post (see Figure 1E, Point 1). The post can then be positioned on the setting, heat applied until the solder flows. It should then look like a slight cone around where the post joins the setting (see Figure 1F, Point 1). This completes the earrings. The stone still must be set, but before setting now is the best time to polish the settings and posts, as it is almost impossible to polish inside the prongs after the stones are set.

POLISHING POST EARRINGS

The best way I have found to polish post earrings is to use a pin vise, clamping the post tightly with the post completely inserted in the vise. Using a two-row bristle brush on the polishing motor charged with tripoli or a comparable abrasive between the prongs can be polished bright. Then the outsides of the setting can be polished. To polish the posts, move them outward in the pin vise and while using the two-row bristle brush rotate the pin vise, and all but the ends of the posts can be polished. Remove the earrings from the pin vise; the ends of the posts can then be polished by holding the settings in the fingers. The same procedure can be followed using another two-row bristle brush charged with rouge or a comparable abrasive.

In setting the stone the earring can be held with a pin vise. Or it can be attached to the end of a short piece of dowling large enough to get a good grip with the hands using stick shellac, after drilling a hole into which the posts are to be inserted. A seat can be cut with a setting bur the same diameter as the girdle of the stone. The prongs can be bent over the stone using setting pliers or a prong pusher. They can be cut off with a jewelers saw to uniform length, filed to shape, and polished again using the two-row bristle brush charged first with tripoli or a comparable abrasive and then with rouge.

NEW POTENTIAL FOR REPAIRS

This type of earring described above seems to be the most popular earring worn today. There are so many different designs that stores have large display cases full of them. This brings a new potential for repairs and additional income for the jewelry repair craftsman. Many are made in circles, ovals, squares, rectangulars, diamond shapes, triangular in plain designs. Most are made with hollow karat gold to keep the cost down. Being manufactured on a production basis, many are not too durable–so the demand for repairs is also great.

Posts breaking off seems to be the most common problem. These can be easily repaired by gold-soldering them back in place or making a new post to duplicate the other earring and gold soldering it on. If stones are set in them they are most likely prong or bezel set, so any stone that will not stand the heat for soldering the post back in place can easily be removed the reset after soldering. Some customers become so attached to a pair of these earrings that when one is lost or damaged beyond repair they are willing to pay the cost of having a duplicate pair handcrafted, which can usually be done from solid gold instead of hollow. This will make a pair that cannot be damaged beyond repair.

Threaded posts with threaded nuts (screw posts and nuts) also are available from most material distributors. They are available in gold filled, sterling silver, or 14K gold, either white or yellow. Over the years experience has taught me never to install a post of any type on pierced earrings of lesser quality than 14K. (Few people are allergic to 14K or higher karat gold. It is the base metals used in gold filled that many are allergic; some are even allergic to silver or the corrosions that are created when silver tarnishes.) By doing this it holds complaints to a minimum. Most customers are satisfied and you build a fine reputation as a jewelry craftsman.

The selection of friction nut posts or screw posts is up to the customer, and as friction nut earring posts are usually satisfactory, I only install screw posts if a customer requests it. Most post earrings made before World War II were screw posts, so today many of these are in need of repair. The most common problem is that the threads are worn out on either or both the post and nut. Many of these can be repaired by rethreading.

The nut can have the hole made smaller using a closing punch, then new threads can be tapped. There are taps and dies made for this purpose and are available from material distributors but I have always been able to make these repairs using watchmakers die plate and taps. The other alternative to this is to replace them with new screw posts and nuts which are installed the same as the friction nut posts as was explained in making the stone set earring. A simple way to make pearl earrings is to use ½ drilled pearls and cut the friction post about 2 mm longer and simply cement the pearl on using Aron Alpha® cement, or a comparable cement. It is much better to gold solder a small disc about 2 mm to 4 mm in diameter that is drilled in the center with a drill that drills a hole .8 mm in diameter. Using a post about 12 mm long, push the unfinished end through the disc until about 2 mm protrudes, then gold solder. After polishing, mount the pearl with cement. Posts already with the disc are available from material distributors and can be found in their findings catalogs.

(Please turn to page 23)

TECHNICALLY WATCHES
(Continued from page 12)

Figure 7 shows the small drill press vise being used on top of the bench. This illustration shows a piece of cork fastened between the jaws of the vise for supporting an article while it is being filed flat. The cork gives enough to allow the file to rest flat on the article which causes the file to make a flat surface.



Figure 7

Figure 8 shows the cork set lower in the vise jaws and an article resting loosely between the jaws on top of the cork. This is also a good method to use when filing an article flat. When the article is filed, it goes against the inside of the vise jaw which prevents it from sliding off of the cork. The cork gives to allow the article to remain flat against the surface of the file.



Figure 8

Figure 9 shows how a small file such as a needle file or an escapement file is held while filing something delicate in the drill press vise. The file is held somewhat like a pencil is held.



Figure 9

"Files and Filing" will continue next month.

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PICKLE BARREL

(Continued from page 21)

MAKING EARRINGS WITH ODD-SHAPED STONES

Odd-shaped stones or nonstandard cut stones can be made into earrings by making a base and then applying a bezel or prongs. The post can then be gold-soldered on and polished and cleaned before setting the stones. Instead of soldering on a post, a ring can be soldered on the top and attached to an earring with a loop for a dangle which will make drop earrings. With only one earring the loop or ring on the top can be used to hold a pendant loop and a necklace can be made by simply using a chain.

It has always been my contention that if you can make a piece of jewelry you will be able to repair it because half of a repair is understanding the construction of the article and the function of all its components. Even in repairing manufactured articles, it is a good idea to dismantle old pieces to better understand their construction. Dismantling old gold engagement rings by heating and taking them apart at the solder joints will teach us much about their construction as well as separating the yellow from the white gold that can be melted down and used in repairing other jewelry.

In the next article we will discuss boric acid and alcohol for shielding as well as fluxing and pickling.

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WATCH TESTING EQUIPMENT

This variable power supply (Figure 1) was designed to be used with a commercially available volt-ohmeter (VOM). It provides the watchmaker with the capability of supplying accurate voltages to the watch for the various tests needed. It has a nine volt transistor battery to supply power; however, it is designed to permit an output of about 3 volts maximum so that the watch cannot be operated with too high a voltage.

The red and black binding posts at the top of the power supply are provided to connect plus and minus leads from the volt-ohmeter. The toggle switch between them will allow measurement of volts (V) or milliamperes (A). The red and black leads that extend from the bottom are fitted with alligator clips to connect to plus and minus terminals of the watch.

When selecting a volt-ohmeter to use with this power supply, several conditions should be considered. The meter must be of good quality with high sensitivity of at least 20,000 ohms per volt. It should have a microampere scale that reads in the area of 0 to 30. A scale lower than that is preferable since most readings on quartz watches will be less than 10 microamperes and more frequently less than 5.

The D.C. voltage scale should be low enough to provide accurate readings in the 0 to 3 volt range.

The meter used in this example is a standard volt-ohmeter and it has many scales that will not be used for watch measuring. In this demonstration only the D.C. voltage and amperage scales will be used. For simplification all the diagrams of the meter used in Figures 2 through 8 will only show these scales. To adapt to a meter that will be used, it will be necessary to first determine which scales will be used and locate the settings of the selector switch.

BATTERY TESTING

To test the watch battery, only the voltmeter is used (Figure 2). The D.C. voltage scale of the meter should be set to the range as low as possible to the voltage of the cell being tested. Most VOMs will have a scale of 0 to 3 VDC, or 0 to 5 VDC. Since there is little internal load from the meter applied to the battery, only the available voltage of the battery can be measured. The "under-load condition" of the cell cannot be determined.

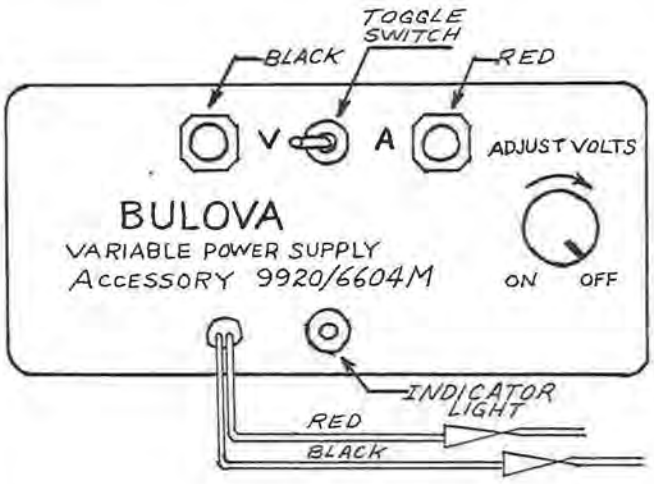


Figure 1

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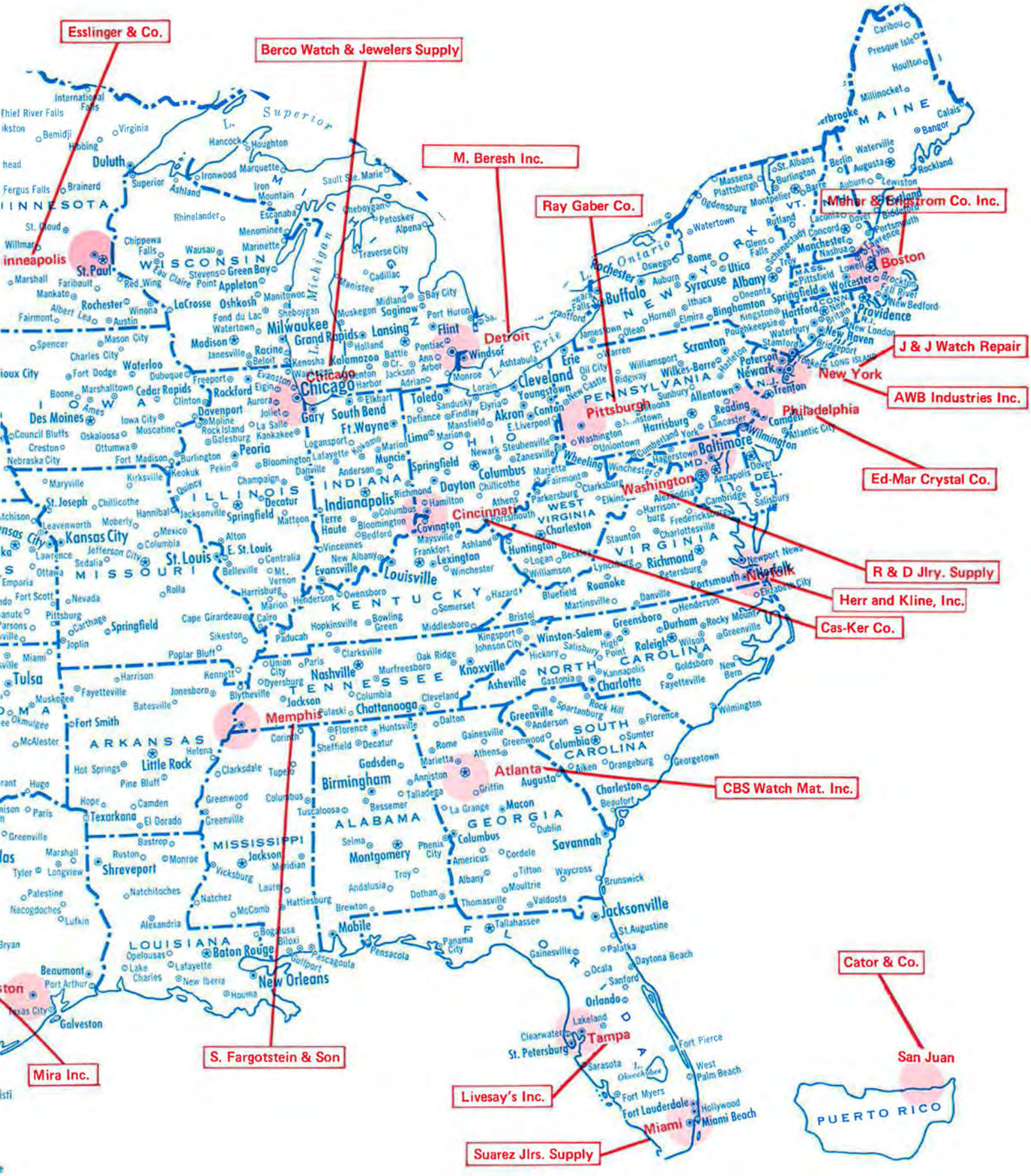
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CURRENT CONSUMPTION

Connect the meter leads to the variable power supply observing proper polarity, + red; – black. Move the power supply toggle switch to volts (V); see Figure 3. With the meter set to measure DC voltage on a scale that is more than 1.5 volts, adjust the power supply voltage to 1.5 volts.

Connect the power supply leads (with alligator clips) to the positive and negative connections of the watch (+ red, – black). Switch the toggle switch to "A" amperes (Figure 4), and move the selector knob on the meter to the microampere scale. Most meters will have a scale 0 to 10, 0 to 30, or 0 to 50 microamperes and higher. Since the measuring will be microampere values in the 0 to 5 range, select a scale that is nearest to that. When measuring, there can be three possible readings of current consumption that will tell the condition of the watch.

1. No reading on the meter, needle remains at 0 (A, Figure 4).
   a. Leads may not be connected properly; recheck.
   b. Leads may be broken; check for continuity of the leads.
   c. Check for loose screws on the circuit board (especially the ground screw).
   d. Corrosion between contacts not allowing continuity.
   e. Circuit board may be bad and need replacement.
2. Low steady reading (B, Figure 4). This reading indicates that current is flowing into the circuit and the quartz crystal is vibrating but the current is not flowing through the motor coil.
   a. The stem may be in the setting position and shutting off the current flow beyond the circuit board (a normal condition in many watches).
   b. There may be a loose screw or no connection being made between the circuit board and the coil.
   c. There may be an open circuit in the motor coil, i.e. the wire from the contacts to the coil may be broken or the coil wire itself could be broken.
3. A plusing of the needle (B to C, Figure 4) with every impulse from the circuit board. This is a correct indication of a properly operating circuit board and motor coil. Keep in mind that this pulse takes place at different intervals, depending on the design of the watch. A watch with a second hand will have a pulse every second; watches without can have these pulses at 5-, 10-, 12-, 20-, 30-, and 60-second intervals.

PULSE TEST

Pulse testing of a quartz watch is done to determine whether there is an output from the integrated circuit of the electronic assembly. This is measured at the terminals of the electronic assembly where the motor coil wires are connected.

For this test the battery must be installed in the watch, or 1.5 volts can be supplied from the power supply. The meter should be set to the lowest voltage scale. The + red and – black leads from the meter are touched to the terminals of the watch where the motor coil is connected (Figure 5). Polarity is unimportant. If the integrated circuit, quartz crystal, and all components of the electronic assembly are in good order, the needle on the meter will pulse each time the electronic assembly sends a signal to the motor. The meter needle will move back and forth with each impulse since the current flow is reversing each time. Here again, remember that the pulse will be at 1-, 5-, 10-, 12-, 20-, 30-, and 60-second intervals, depending on the design of the watch. The value of the pulse reading is not important. All that need be observed here is that there is an output.

On some meters the D.C. voltage scale is too broad so that the pulse will be very small and difficult to observe. Switching to a micro/amp scale on the meter will often give a signal of greater amplitude.

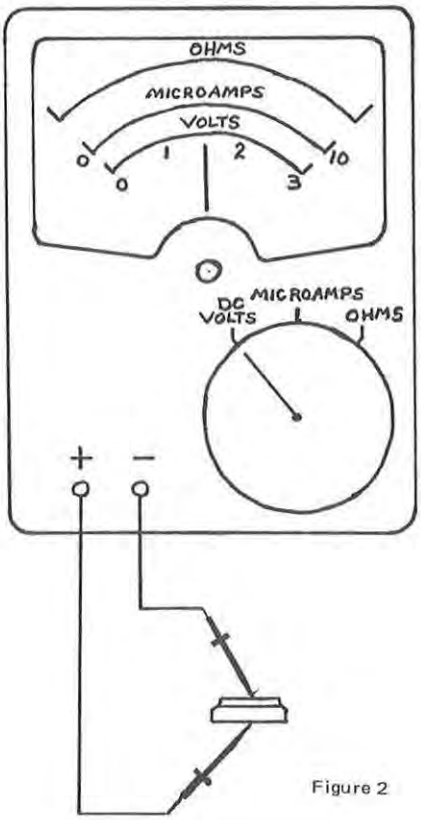


Figure 2

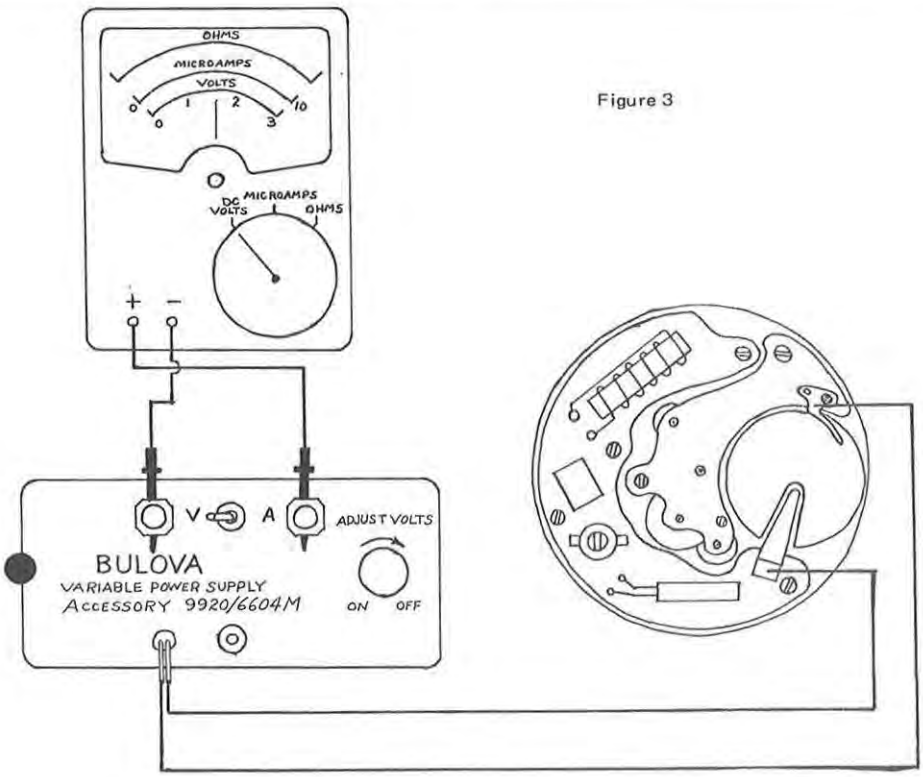


Figure 3

On some model watches it is not possible to get to both motor coil leads to perform this test. It is still possible to test by touching one of the meter leads to the watch mainplate (shown by dotted line in Figure 5), and the other to one of the coil connections. In this case, however, the needle deflectors will only be in one direction and will appear with every other pulse.

RESISTANCE MEASURING OF COIL; COIL INSULATION TESTING

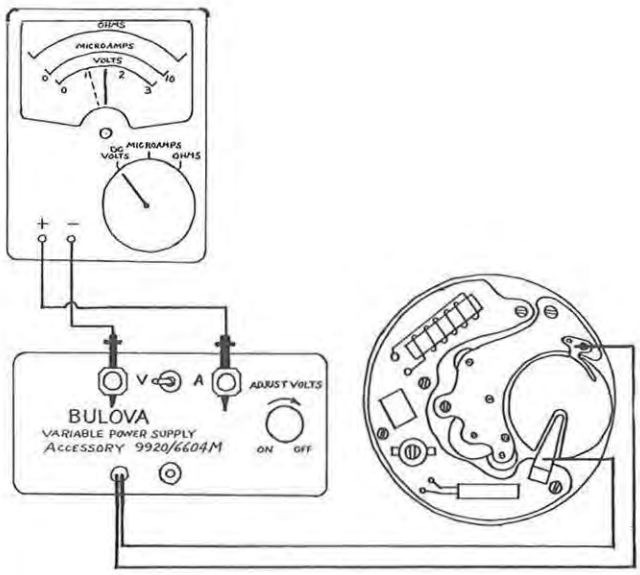
These two tests can be done simultaneously because the testing is being done on the same component. There are three conditions of the motor coil that can be determined: (1) good, (2) open, and (3) grounded.

The resistance of the coil can be measured directly using an ohmeter. In order to do this, however, the coil must be disconnected from the electronic assembly. Many newer model watches have the coil soldered permanently to the electronic assembly and therefore cannot be easily disconnected. It is possible to measure continuity of the coil without disconnecting it, by using the power supply and the ammeter.

With the + and – leads from the meter connected to the power supply, and the toggle switch to A (Figure 7), connect the alligator clip leads together.

1. Set the meter to lowest microampere scale and adjust the voltage until the meter needle goes full scale (Point D, Figure 7). This procedure applies a very low voltage through the test equipment (less than 0.2 volts). This is not a large enough voltage to flow into the integrated circuit and give a false reading. The current flow is only through the coil so its condition can be evaluated.
2. Remove the battery from the watch.
3. Disconnect alligator clip from one another and apply to the points on the circuit board where the motor coil wires are connected (Points 1 and 2, Figure 8).

Figure 6



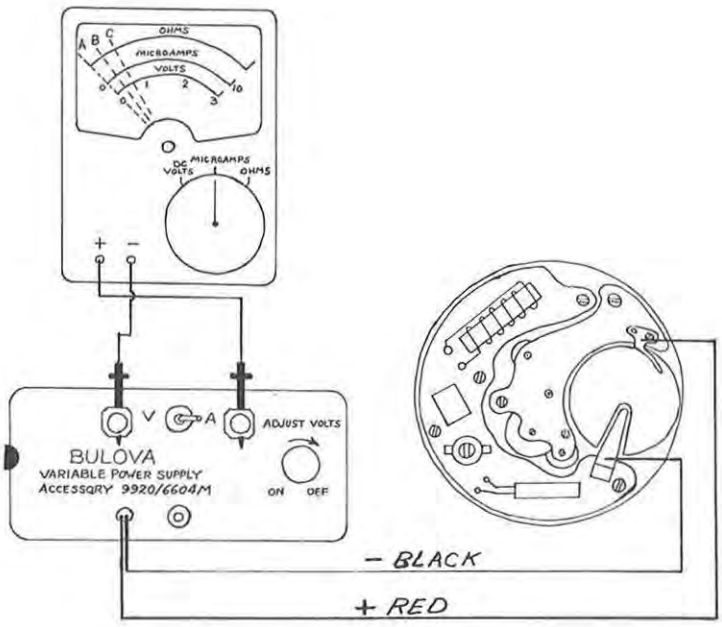


Figure 4

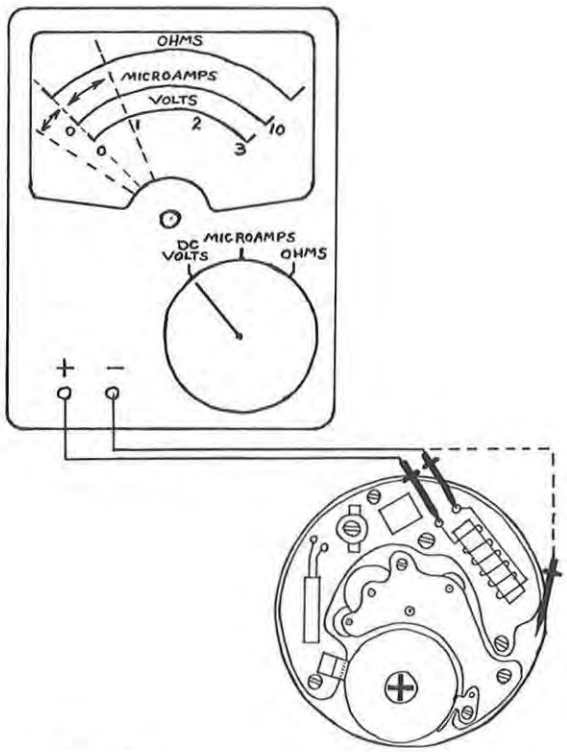


Figure 5

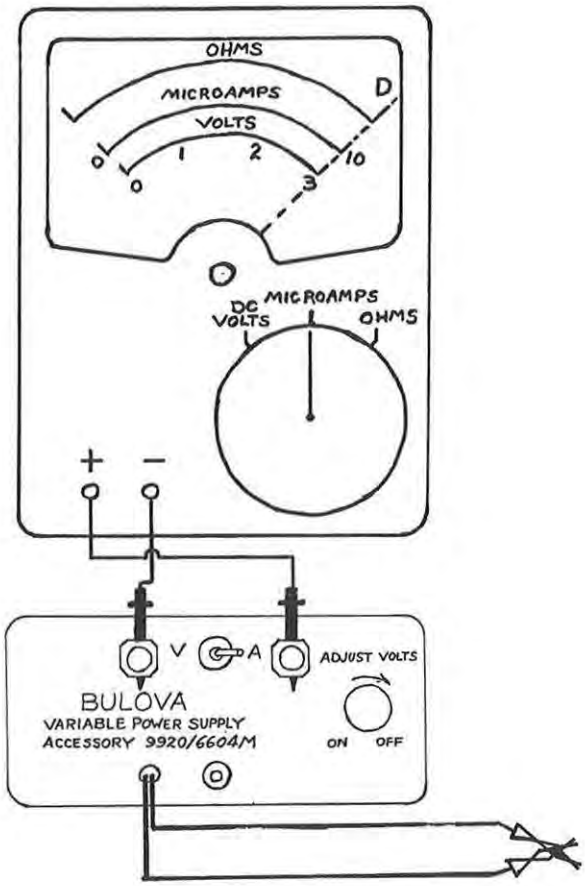


Figure 7

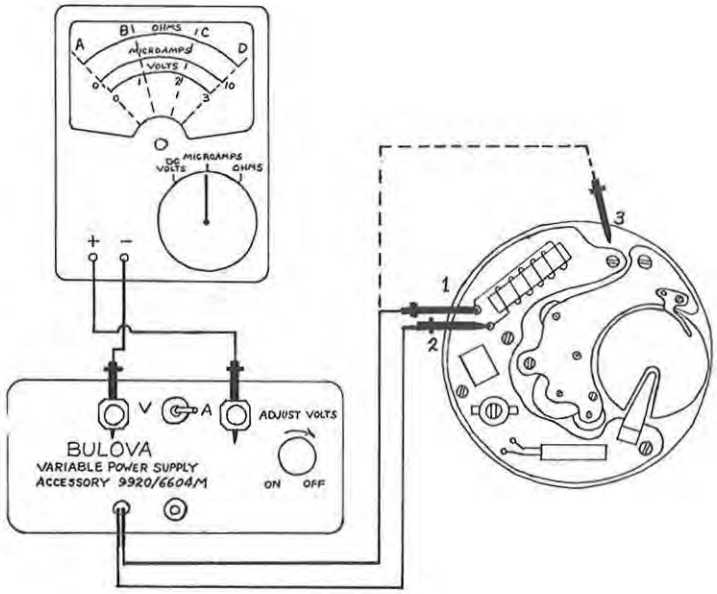


Figure 8

a. If the coil is good, the meter indication will go midscale, the area from B to C, Figure 8.
b. If the coil is open the needle will remain at 0 (Point A).
c. If the coil is shorted, the needle will go full scale (Point D, Figure 8).

4. In order to check for a grounded coil this same set-up can be used. Place one of the leads from the power supply onto the mainplate of the watch (Point 3) and leave the other connected to either one of the terminals of the coil.
   a. If the coil is not grounded, the needle will remain at 0 (Point A).
   b. If the coil is grounded, the meter pointer will go up to an area anywhere from Point A to Point D, depending on where the ground is in coil.

A grounded coil cannot be repaired. It must be replaced.

CONCLUSION

The tests described in these procedures permit the repairman to test all conditions of the watch and determine what action must be taken to correct them.

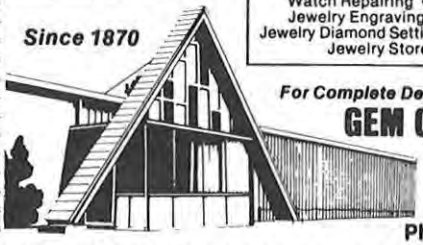
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BIRTHSTONES

Edgar Cleves, Jr.



NOVEMBER

TOPAZ

Topaz, along with some fancy prefix, is used by many jewelers for just about any yellow stone on the market. One of the most common, smoky topaz, is citrine, the yellow variety of quartz, which is far more plentiful and not as valuable as topaz. Because yellow is the most popular color of topaz, it has become customary to believe that all topaz is yellow. However, topaz is available in yellow, yellowish-brown, orangish-brown, light to medium red, light to medium blue, light green, violet, light greenish-yellow, and colorless.

The gemstones which many may mistake for topaz are quartz, sapphire, synthetic sapphire, spinel, synthetic spinel, beryl, tourmaline, garnet, chrysoberyl, spodumene, doublets, and glass.

Topaz crystallizes in the orthorhombic system and has perfect cleavage. On the Mohs scale of hardness it is 8. It is an aluminum fluosilicate. The chemical composition is $AlSiO_4$ $(F, OH)_2$. The great majority of topazes found are beautifully developed, glistening crystals of great perfection. The luster is vitreous. The specific gravity of yellow to brown and light red is 3.50 to 3.54 and the specific gravity of all other colors is 3.53 to 3.59. The indices of refraction range between α = 1.607, γ = 1.637 and α = 1.629, γ = 1.637. Birefringence varies from .008 to .010. Topaz is biaxial positive. The dispersion is .014. When exposed to ultraviolet rays, little fluorescence is perceptible. Topaz, when polished briskly with a cloth, will even develop enough of an electrical charge to attract and hold small bits of paper.

The prime source of topaz is Brazil. Other sources include Rhodesia, Nigeria, Russia, Madagascar, Japan, Sri Lanka, South Africa, Afghanistan, Mexico, Scotland, and Ireland. In the United States, topazes are found in Utah, Maine, New Hampshire, California, and Texas.

The topazes in The Smithsonian Institution are: from Brazil, a 7725 ct. yellow, a 3273 ct. blue, a 2680 ct. colorless, a 1469 ct. yellow-green, a 685 ct. pale blue, a 187.2 ct. colorless, and a 129 ct. sherry; from Russia, a 398 ct. pale blue and a 155.5 ct. blue; from Colorado, a 234.6 ct. colorless; from Madagascar, a 170.8 ct. champagne; from Texas, a 146.4 ct. pale blue; and many other fine specimens below 100 ct. are from Japan, Maine, New Hampshire, and California.

The mineral collection in The British Museum contains two large topazes of historical significance. One is a blue step-cut flawless gem from Brazil weighing 614 cts. The second is a colorless oval faceted flawless gem of 1300 cts. There are also several uncut topazes in the collection. One is a large flattened pale blue weighing eight pounds measuring 7 x 5 x 2 inches from Brazil. Another large colorless gem from Brazil weighs 29 pounds and another colorless gem from Sri Lanka weighs 13 pounds. The largest is an opaque topaz from Norway weighing 137 pounds.

TREATED

In 1949, the Gemological Institute of America reported that topaz had been colored by radium. A light blue stone had been changed to a deep brown. Upon further exposure, the stone turned to a light amber and then a deeper amber. Fine dark blue topaz is now on the market. There are no tests which can distinguish between the natural blue topaz and the treated blue topaz.

DOUBLET

Several years ago, Lechleitner produced a doublet of topaz on a seed of beryl. The stone had indices of refraction of 1.609 and 1.620.

SYNTHETIC

Synthetic topaz has been grown by the hydrothermal method, but in sizes too small to cut.

Historical records seem to indicate that topaz was first identified about 500 or 600 B.C. However, many times throughout history, it has been confused with chrysolite, peridot, and yellow jasper.

According to the "Book of Wings" written about the 13th century: If you possessed a topaz on which was carved the figure of a falcon, it would help you acquire the goodwill of kings and princes. In the Hindu religion, the Kalpa tree, a symbolical offering to the gods, was composed of seven precious stones. One of these was topaz. In the old Hindu treatise on gems, topaz symbolized the planet Jupiter and had to be set in the Northeast part of the necklace or ring. According to the occult practices of the Burmese, topaz was used as the fifth stone of the Naoratna. According to The Bible, after the destruction of the Temple and its restoration, a second breastplate was made. Topaz is the tenth stone of the second breastplate. In the book of Revelation, the 9th foundation of the New Jerusalem was garnished with topazes. Andreas, bishop of Caesarea, claimed that topaz represents the Apostle Matthew, who was found worthy to enlighten by his gospel, those whose hearts were blinded. In astrology, topaz represents Sagittarius, the Archer. However, in the old Spanish list, it represents Leo, the Lion. It is one of the acrostic stones of faith, charity, and dearest. Throughout the world it is used as the birthstone of November as well as the gemstone for the 16th wedding anniversary.

According to a book of dreams written in the 8th century, it was said that anyone dreaming of topaz would not be harmed. Ancient lore says that topaz is in sympathy with the planets Saturn and Mars. It is also associated with the right and left wing of Raven 8° of Libre.

The medicinal use of precious stones can be traced back to ancient times. St. Hildegard recommended that a topaz be put in wine for three days. Then the moistened stone could be rubbed on the eye. This was supposed to be a cure for poor vision. A 15th century Roman physician claimed that he could cure the plague by touching the sores with a topaz. This topaz had been owned by Pope Clement VI and Pope Gregory II. Many Christians probably had a great faith in the curative powers, since it had been in the possession of two pontiffs.

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ANOMALOUS TRIVIA

By Q.T. Anomaly

The Early Days of Timekeeping

Charleston, South Carolina is a beautiful city. Many of the buildings date back to the early 1700's. Walking through the historic district, you're taken back to the days of the swashbuckling pirates and the Revolutionary War. One can't help but wonder what it must have been like to own a jewelry store in those days.

Actually, jewelry wasn't too popular in colonial times. In order to make a living, they branched out into other businesses such as, "Jewelry and Horseshoeing"; "Jewelry and Carriage Repair"; "Fine Jewelry and Slaves". One even taught dancing. Many of you have danced the "Charleston". This came from South Carolina but didn't come into vogue until the "twenties". It was the early jewelers who diversified like this that saved the jewelry business in this country.

Back then, there weren't too many watches around. Most people carried clocks with them. Some of these proved to be very unwieldy, like the large grandfather clocks. The sea captains living in the area didn't care for them because it was difficult to keep them level while aboard ship. One captain, while making a run from Charleston to New York, counted too much on his clock for navigational purposes. The ship encountered several storms during which time the clock ran erratically. On the way back, he bypassed Charleston and landed instead in Honduras.

Later on, the mantel clocks became popular because they were much easier to carry. The only problem was that it took two people to carry the mantel and they had to be the same height or the clock wouldn't work.

Tower clocks were a method of timekeeping on which many people relied. As long as they ran, everything was okay. When a problem developed, it was hard to find a clockmaker to repair them because most were afraid of heights. An early clockmaker worked on one but he never could get all four dials to read the same time. He finally painted huge signs to hang beneath the dials telling of the difference between the dial time and the correct time. For some reason, the townspeople weren't too happy. It just goes to show that even back in the early days it was hard to please everybody.

One good thing about the early times, they didn't have to worry about holdups like many do today. Can you imagine a guy with a peg leg and a black patch over one eye, jumping through the door, brandishing a sword and saying, "This is a holdup!" Then he grabs a grandfather clock, warns you not to summon the police, and stumps out the door. When the police arrive, you give them a complete description and the officer says, "Did you notice anything unusual about him?" It just so happens that during a holdup like this, the shop owner also grabbed a sword and as they were dueling, one of them swung his sword and missed, but wacked off about a foot and a half of a grandfather clock. Thus was born the famous grandmother clock.

Another way they had of telling time was the town crier. He walked the streets making announcements, finishing off with the time and the final statement "all's well". In the smaller towns, his job was in jeopardy if the tower clock stopped working. He then had to guess at the time. One town, because of the crier, ended up in utter chaos. Everything got off schedule, even the airplanes and trains. It's a good thing they weren't invented yet or it would have been a big mess. The town has been fouled up ever since. If I remember right, it was somewhere in Virginia.

There were some great silversmiths in their heyday during the early years. Some beautiful pieces of holloware were produced in the colonies. One prolific silversmith used a great piece of public relations and became well known, not so much for his talent, but for riding around on a horse shouting at people. A lot of his bowls are still being sold today.

That's about it for colonial times except for one piece of information I came across while doing research for this article. It seems that it was during this era that Hong Kong started to make quartz watches and stockpiled them to ship to this country later on!!!

Battery News

By Ewell Hartman, CMW

BATTERY NUMBER SYSTEM

Refer to your **1985-86** Battery Number System booklet to make the following additions:

Section II – Specifications and Cross-Reference

AWI, S16: Add to Ray-O-Vac, 366
AWI, S32: Add to Timex, BA
AWI, S34: Add to Timex, DA
AWI, S38: Add to Timex, HA
AWI, S48: Add to Diameter, 9.5
AWI, S48: Add to Height, 1.1
AWI, S48: Add to Eveready, 311
AWI, S52: Add to Ray-O-Vac, 317
AWI, S54: Add to Ray-O-Vac, 319
AWI, S56: Add to Ray-O-Vac, 379
AWI, A09: Add to Ray-O-Vac, *RW87

SERVICE IDEAS

Dennis Myers of Chatham, Ontario called us about a Ray-O-Vac RW87 which he could not find listed. We contacted the manufacturer and learned that it is being marketed in Europe. We have added it to the BNS under listing "A09." If you find this battery in a watch, replace it with an "S13" which is also a high-drain of the same dimensions. This replacement will properly supply current to the watch for a much longer period of time.

INDUSTRY NEWS AND COMMENTS

Henry B. Fried sent us an article from the "Hong Kong Trader" which points out that China is now the world's largest producer of micro batteries. According to their source, China produced more than four billion batteries (you read correctly) last year. The Japanese and Americans are the major consumers, using an average of 15 to 20 batteries per year, most of which are the type used in watches and calculators. Batteries continue to be "Big Business"!

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SHOP TALK

Wes Door, CMW



MAKING A HEAT MASTER

In July's "Shop Talk" on cleaning cases and push buttons, we briefly mentioned the need for a good method to dry these parts and others.

We already have built-in drying units on all of our better watch cleaning machines and we certainly do not need to improve on these if they are used according to factory instructions. However, we do not need a better "mouse trap," but a better method of drying all the "other-than-watch-parts" items. This includes watch cases, rings, etc.

At first thought, the need for a jewelry item dryer may not be obvious since these items do not rust and natural air drying seems adequate. The need does exist if we need to speed up production and be sure the items remain clean while preparing them for other finishing processes, such as rhodium, gold plating, or resealing a pearl, etc.

Our purpose this month is to show how to make a dryer which will be suitable for the above-mentioned jewelry items, but more important to be used to dry watch cases. Without using some accelerated method of drying cases, we lose valuable time and we may have spots on the case and/or we may not be quite sure if we let it set long enough to completely air dry. A watch case with moisture left in it (which has the potential ability to rust the watch parts) may be worse than not cleaning the case at all. So we know we need to thoroughly dry the watch case, including its crystal, etc. It seems even more important on cases of LCD watches with pushers, some of which need to be left in the case while cleaning and drying (because of economics).

Now that we have established the need for a good dryer, I would like to show how to make one, like mine. I have been having a little trouble with the spring wound timer on mine, and since I was writing this article I thought this was an ideal time to change this timer. So I took my heat master apart to replace this timer unit and realized (after reading my scratch-mark date inside) that I made this in 1969–16 years ago–so I did not bother looking up the guarantee on the timer unit. I even forgot where I bought it, but yesterday I found a new timer switch at a local electrical and plumbing store.

While installing and inspecting my 16-year-old heat master, I was pleased to find the inside wooden walls not

FIGURE A

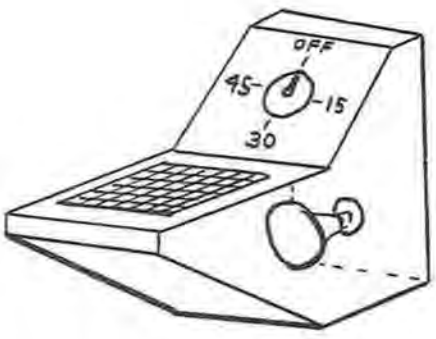
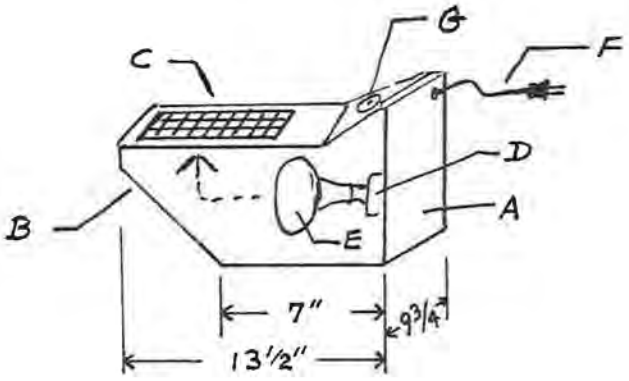


FIGURE B



scorched. Knowing that these are safe measurements, let's proceed to make our heat master, realizing that it is not necessary to conform to this exact shape or size (see Figure A). Notice the 45-degree angle on the front allows heat to reflect upward to and through the screen and does an excellent job. However, plastic watch crystals should be far enough away so as not to overheat. The infrared bulb seems to last a long time, even with continued on-and-off, daily use. I hope to get another 16 years out of my homemade heat master dryer before more repairs are needed.

If you are considering making a heat unit, I hope this helps. The following materials are needed (see Figure B):

A. Wood (two sides and back only).
B. Tin (wrapped around front, top and back); Bottom is left open.
C. A removable screen to cover hole cut out of top.
D. Socket and two wood screws (to fit inside back).
E. One 5" diameter infrared bulb, 250 watts, 120V.
F. A good heavy-duty cord, polarized (one blade wider than the other).
G. A spring wound time switch (mine is a 60-minute one; others are available for 30, 15 minutes, etc.)

Readers Write

The "Technically Watches" column by Archie Perkins and the articles on clock movements by Steven Conover make membership in AWI very much worthwhile.

When I first became interested in repairing clocks after retiring from active business life it was only with the greatest difficulty that entry into the craft was achieved. Eventually a small advertisement in a craft magazine put me in touch with a man in Frankston, TX who offered a correspondence course on clock repairing, but in spite of the excellent material in that course, I soon discovered that his course had no official standing in the trade, and it was only by good luck that the address of AWI turned up enabling me to become a member.

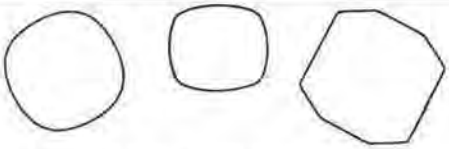
It was suggested to me that a good possibility for employment would be by becoming associated with a retail clock outlet, offering to do their repair work. This suggestion turned out to be a good one; a large company with stores in many Canadian cities had a branch in a nearby city of about 100,000 that offered me the chance to see what I could do. In the past four years I have repaired about 1700 clocks for them.

If my experience is any indication of the general situation around the country, there must be hundreds of thousands of clocks gathering dust for want of someone to repair them. The older clockmakers are retiring or have passed on, while younger people are not being encouraged to take their places. The main emphasis in the H.T. seems to be watches, and that is limited for the most part to changing batteries. The official view may be that there is really no future for mechanical clocks, but when people are willing to pay handsomely to make their treasured timepieces run, as I have found, there still must be plenty of opportunities for interesting–and profitable–employment.

Rodger J. Ross
Ontario, Canada

Let me take this opportunity to tell you how much I enjoy your magazine. Even after over 40 years at the bench, there is always something new to learn or to be reminded of.

Pierre Delecroix
Valley Center, CA



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AWI NEWS



Milton C. Stevens

AWI Offers Video Programs

Several years ago, the Horological Association of California prepared a video tape featuring Jay Foreman. It provided instruction on servicing the Atmos Clocks. This tape illustrated the viability of using this media to convey information and instruction. For several years attempts were made with home video equipment to create programs for AWI, but none were really successful.

Last year, Zantech, Inc. provided us with a demonstration tape which was made from one of AWI's existing slide tape programs. The quality was quite good, and it renewed our interest in the development of video tapes. At this point, we welcomed the offer which the Horological Association of Virginia made, giving us the opportunity to tape a special program they held in Norfolk, Virginia in February of this year.

As a result of the taping of the Virginia program, we were able to obtain two diverse but interesting programs which were presented by Mr. David Todd of the Smithsonian Institution. One titled "Origins of the London City Guilds" features the "Clockmaker Company" in particular. The other program is entitled "Treasure of the Quick Silver Galleons." As indicated by the title of the first program, Mr. Todd traces the development of the English Guild system as it developed through the centuries. He gives special details on the establishment of the Worshipful Clockmakers Company and the Windmills family. The second program is based on a story which appeared in National Geographic magazine in December, 1979. It is a fascinating story of the recovery and restoration of an English Bracket Clock which was found in the wreckage of the sunken galleon.

The success of this taping provided us with encouragement to tape the Silver Anniversary programs which AWI presented this June. Thanks to the efforts of Louis and Greg Zanoni (Zantech, Inc.) we now have five excellent taped programs from that occasion. One must remember that these programs were shot live on location and have no editing. With this in mind, the Zanonis are to be commended for the superior job they did under rather difficult conditions.

The first program, "Precision Time Measurement and Distribution," is presented by Dr. Gernot M.R. Winkler, Director of the Time Service Division of the U.S. Naval Observatory. Dr. Winkler discusses the sophisticated methods developed by the Observatory to insure the delivery of precise time.

Mr. Joe Thompson draws on his experience as Editor of *Modern Jeweler* magazine and as an informed observer of the watch industry in his program "The State of the Watch Industry Today." Thompson discusses in detail the thinking and direction of the Japanese watch manufacturers as they seek to broaden their markets. Citing authoritative figures, he points to specific trends which are expected to prevail in the watch industry. Mr. Thompson describes quite candidly the Swiss "come-back" and the effect it is having on certain segments of the watch market.

"The Invention of Standard Time" is ably presented by Ms. Carlene Stephens, Assistant Curator of the Smithsonian Institution. Ms. Stephens was given the assignment to prepare a special exhibit for the occasion of the one-hundredth anniversary of the development of Standard Time. She uses charts and photos from the past to create this most interesting program.

George Daniels, who has been described as the most accomplished horologist to live in several centuries, uses drawings, photos and the chalkboard to explain how he creates a timepiece, first on the drawing board, and then by fabricating the raw material into a treasured timepiece. Daniels shows how he handcrafts a watch from sketches and calculations made in his special drawing room. He uses photos to show the kinds of machinery he uses in his shop, as he describes every detail of manufacture. This includes the watch movement and especially designed escapement which will rival the accuracy of quartz watches.

Scott Carpenter, one of the original seven U.S. Astronauts, was the second U.S. spaceman to orbit the earth. Carpenter separates fact from fiction concerning those events of the early U.S. space effort. He describes his personal experiences as both astronaut and aquanaut. He is enthusiastic about the benefits both ventures have contributed to mankind. Carpenter gives details on the role precise timekeeping plays in the space program. He also discusses the role the space program has, and will, play in the horological industry.

Carpenter uses the insight gained from first-hand experience to discuss the competition in space between the U.S. and Russia. He makes an appeal to the public for vigorous support for the U.S. space program. He points out that the U.S. is playing "catch-up" in the race to use outer space for strategic defense systems. Carpenter says the Russians now hold a considerable lead and that we need to improve our position in the so-called "Star Wars" program.

We believe that with the programs mentioned here, AWI is well on the road to providing interesting, diversified programs for local and guild meetings, as well as for individual viewing. We do have a limited number of copies of each program. We will schedule the loan of these video programs on a "first-come, first-served" basis. Please contact AWI Central if you wish to reserve a program. Give us a preferred date and an alternate. We will do our best to fill your requests.

QUESTIONS & ANSWERS
(Continued from page 6)

notable examples of this is in the lobby of one of the great universities in the Carolinas. A prestigious tower clockmaker was ordered a clock for their cupola. After it was installed it was found that the two-second pendulum's 13 foot plus length caused it to be hung below the floor of the lobby. The company, to satisfy the university so that the bob be seen swinging in the glass case, supplied a false bob, merely again adding a little compensatory length to the (unseen) lower pendulum bob.

However, the question most frequently asked in this area is how to make a pendulum clock keep time when its pendulum is much too long for the case. How can this movement be made to keep time without a change of gear ratios?

The answer, while not as simple as those provided here above, nevertheless can be accomplished by compounding the pendulum. Compounding means many things but in our case it means to change the nature of the pendulum so that it acts much like that of a metronome's. Also, if you've seen some of the Ansonia swinging clocks where the clock is suspended by the arm of a statue, the movement held inside a ball which is at the top of the clock and a long thin rod with a light ball, smaller than the clock way above at the lower end. The clock ball swings by three crossed small springs and from a tiny hook or scaffold-rod held in the hand of the statue. In such a pendulum, the greatest weight is above the point of suspension. Now, as in the similarly weight metronome, to make the clock go faster, the lower ball is lengthened; to make it go slower, the lower ball is shortened. Likewise in the metronome, to make the pendulum go slower, the top weight is raised, and to make it hasten, the weight is lowered.

Therefore, to make a fast moving pendulum clock go slower in its pendulum's swings, extend a rod from the anchor rod upward and place a small weight on this that can be adjusted up or down. Thus, a pendulum swinging normally at three times a second can be slowed down so that it swings only twice or even once a second, by this system. While this method can't match the accuracy of a regulator or chronometer, the timekeeping will be satisfactory enough and a pendulum can be arranged so that its false bob appears in the lower case's window.

Henry B. Fried

AWI Shop Tip

Here is a source for small quantities of "VEL" Synthetic clock oil. The "VEL" oil used by Hermle to lubricate their movements is available in small quantities from: Timesavers, P.O. Box 171, Wheeling, IL 60090. As you may recall, this is the oil Hermle recommends using any time you wish to add oil to one of their movements without removing the factory oil by cleaning.

David G. Arnold
CMC, CMBHI

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ESA 588.001	5½ x 6¾	ESA 977.001 - Ronda 3572 -	12.95	14.95	15.95
FE 6320	6¾ x 8	FF 60 - ST 69 - ESA 961.001	8.50	9.50	10.50
FE 6820	5½ x 6¾	INT 301.001 AS 1977 - Seiko 11A	8.50	9.50	10.50
Bulova 2500	5½ x 6¾	Popular Bulova Model	15.00	16.00	16.50
Bulova 2801.10	11½ Ligne	SMQ - 7 Jewels Sweep Sec.	12.95		
Bulova 2802.10	11½ Ligne	SMQ - 7 Jewels Date	12.95		
Bulova 2210	7½ x 8½	Conversion Kit Complete Using 2500 Movt	19.95		
Bulova 218-2 Bulova 224-2	12 Ligne	Conversion Kit Complete Using 2783 Movt	30.00		
Pulsar Seiko 480	6¾ x 8	Discontinued - Use Either 481 - 482			
Pulsar Seiko 481	6¾ x 8	Sweep Replace For 480 - Change Hands	8.95	9.95	10.95
Pulsar Seiko 482	6¾ x 8	Non Sweep Replace For 480 - Change Hands	8.95	9.95	10.95
Pulsar Seiko 588	5½ x 6¾	Replacement for 590 - 5420 A	9.95	10.95	11.95
Pulsar Seiko 590	5½ x 6¾	Use 588 - Same Dial - Hands	9.95	10.95	11.95
Pulsar Seiko V230	5½	Thinner Version of 235	10.95	11.95	12.95
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NEWS ...from all around the ASSOCIATION...

HENRY B. FRIED TO ADDRESS JOINT MEETING IN NOVEMBER

The Horological Association of Maryland/Delaware will hold a joint meeting with the Horological Association of Virginia on November 17, 1985. The event will be held at the Marriott Motel, Gaithersburg, MD (Exit 124 E off I-270). from 9 AM to 5 PM. Henry B. Fried, CMW, CMC, FAWI, FBHI, FNAWCC, will conduct the all-day program which will cover Retrofitting and Unusual Clocks. Mr. Fried is a past president of AWI, the Horological Society of New York, and the New York State Watchmakers Association. He is the author of many horological books, including his newest publication entitled *Repairing Quartz Watches*. Mr. Fried's horological achievements are recognized throughout the world.

INDIANA

The Watchmakers Association of Indiana held their annual convention in Indianapolis, IN in September. Mr. Tibor Kentey, National Sales Manager of Bulova Watch Co., and James Lazarus, President of L&R Manufacturing Co., were the keynote speakers.

The membership voted to change the name of the organization to the Horological Association of Indiana. Ray Vance is the new president; Phyllis Sampson is first vice-president, and Steven Settle is second vice-president for the coming year.

LA ROSE ADDRESSES HOROLOGICAL GROUPS

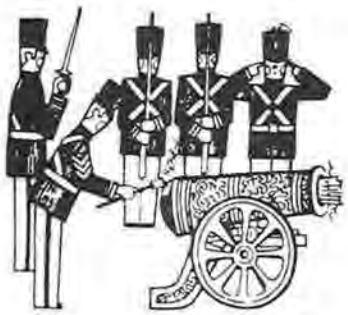
Tom LaRose, president of S. LaRose, Inc. in Greensboro, NC was the featured speaker at two AWI Affiliate Chapter meeting recently.

He spoke to the Horological Society of New York on October 7 and the Watchmakers Association of New Jersey on October 8.

His presentation included a review of the many changes in clockmaking over the past 20 years and how they affect today's repairmen.



Ray Vance (right) is the new president of the Horological Association of Indiana; Phyllis Sampson is first vice-president.



We Salute These New Members!

ARCHONDIS, Nickolas–Saugus, MA
BARNES, Duane A.–San Diego, CA
BEEGHLEY, Blake–Somerset, PA
BLAIR, G.H.–Springfield, NJ
BLAIR, Leigh–Novato, CA
BONCUORE, John–Summit, IL
BOND, Charles E.–Milwaukee, WI
COIL, Yvonne–Fort Wayne, IN
CORNETT, Raymond S.–Marion, VA
CRAWFORD, Kenneth–Lynchburg, OH
DANIELS, George–Ramsey, ISLE OF MAN
ESPINOZA, Juan C.–New Britain, CT
FARBERG, Ted A.–Evansville, WI
FREEMAN, Walter A.–Fort Wayne, IN
GLASS, G. Brandy–Milwaukee, WI
GRANDLIC, Rudy E.–Sheboygan, WI
GUSTAFSON, Burch–White Bear Lake, MN
HAFFORD, Jennifer–W. Newton, MA
HANSON, Charles S.–Valley City, ND
HAYES, Paul V.–Pickering, Ontario CANADA
HINRICHSEN, Keith R.–Milwaukee, WI
HOPKINSON, Josiah–Brooklyn, NY
JANSON, Paul A.–Whitesburg, KY
JOHNSON, Russell D.–Indianapolis, IN
KAZEN, Ken–Corunna, MI
KIDWELL, Dennis A.–Seattle, WA
KMICCIAK, Randy–Oak Creek, WI
KUENY, John E.–Racine, WI
McCALL, Raye A.–Pomona, CA
McDALE, Jeffrey R.–Overland Park, KS
MAOLONI, Anthony J.–Western Springs, IL
MILTON, Robert L.–Elmira, NY
MOLLOHAN, Arthur H.–Chicago, IL
MOLNAR, Michael–Fairview Park, OH
MORGAN, Howard–Vero Beach, FL
MORGAN, Thomas O.–Enola, PA
OVERLIN, Stuart–St. Louis, MO
PARK, Hyun Soo–Augusta, GA
PASCHAL, Donald–Richardson, TX
PEMBERTON, William D.–Gladstone, MO
PITNICK, Lewis H.–New City, NY
PLUMMER, Nancy L.–Milton, MA
PRASAD, Rajendra–Suva, FIJI ISLAND
REINBOLD, Henry–National City, CA
SAMBS, Robert L.–West Allis, WI
SANTIAGO, Raymond J.–Great Falls, MT
SMATLA, Larry L.–Oskaloosa, KS
SMITH, Edward D.–Assonet, MA
STURTZ, Donald A., Sr.–Richmond, VA
TRAINOR, Gary E.–Boston, MA
VAN DUZEE, Lowell–Milwaukee, WI
WOODWARD, John C.–East Norwalk, CT
WORLEY, Eugene R.–Denver, CO
YOUNG, Laurie–Jackson, MI

OHIO

The Watchmakers Association of Ohio, Inc. held its 39th annual convention in July at the Marriott Inn in Columbus. The program featured informative talks by Fred Burckhardt, president of AWI and Milton C. Stevens, executive secretary of AWI.

At the Saturday night banquet, special awards were presented to WAO Executive Secretary, Grace Basch and Jake Montgomery for the many services rendered in the past. Howard Opp presented a special award to John and Pat Hayek, publishers of *Northwestern Jeweler Magazine* in appreciation of their contributions to the organization over the years. Al Brehl and Karl Farnlacher co-chaired the event.

New officers elected include: Robert Allis, president; Wally Curtiss, vice-president; Jake Montgomery, secretary; and Elmer Hilvers, treasurer. New directors elected for the Board in 1985-86 are Lawrence Gordon, Karl Farnlacher, Jake Montgomery, and Wally Curtiss.

NORTH DAKOTA

The North Dakota Jewelers and Watchmakers Association celebrated their 34th Annual Convention at the Seven Seas Motor Inn in Mandan, ND in September.

The program included a seminar presented by AWI instructor Buddy Carpenter on Friday. Saturday's featured speaker was Mr. David Richardson. Alan Herrud stepped down from the president's position and Brad Wimmer accepted the responsibility for the coming term.



Dave Richardson, center, posed with the Board of Directors at the North Dakota Jewelers and Watchmakers celebration.

NEW JERSEY

At the recent Director's meeting of the Watchmakers' Association of New Jersey, Inc. the problem of declining membership and increasing costs to run the association were discussed. A special committee was formed to review all options. The committee consists of Emil Chessari, Don DeWolfe, Charlie Havens, Henry Kalmus, Tony Montefusco, Hans Weber, and John Sokol, chairman.

The following slate of officers were presented by Chairman Joseph Zydiak and the nominating committee: President, John Sokol; Vice-President, Hans Weber; Secretary, Steve Conover; and Treasurer, Alex Kast. Directors include: W. Albrecht, J. Biancola, B. Berthoud, J. Barbieri, J. Cerullo (chairman of the board), E. Chessari, D. DeWolfe, H. Frystak, C. Havens, H. Kalmus, J. Milano, P. Milano, T. Montefusco, J. Prellberg, W. Riegler, A. Stonitsch, R. Wierzbowski, and J. Zydiak.

ILLINOIS-MISSOURI

The Metro St. Louis Watchmakers Association was formulated November 11, 1984 with 16 people attending. The following officers were elected: Donald Ott, president; Tom Rotramel, vice-president; Dave Sanders, treasurer; and Ken Hubler, secretary. Board members are Tim Carpenter, Seldon Ott, Bob Porter, Joe Runtz, and Wally Schroeder.

Meetings are held the first Thursday of each month at Prestons Restaurant in East Alton, Illinois. The charter was presented to President Don Ott by Bob Bishop on August 10, 1985 at a Watch Seminar sponsored by AWI.

The membership now totals 29 and all prospective members are welcome. Area includes south from Springfield, Illinois; east to Indiana, and Missouri to Kansas City.



Pictured above: Don Ott (right) receiving the AWI Charter for the Metro St. Louis Watchmakers Association from Bob Bishop (left).

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by Orville R. Hagans

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Truing a Steel Escape Wheel

That is Out of Round

This is a little difficult on first thought, but it is quite possible if one goes about it in a thoughtful, mechanical way, and is not at all impossible. Of course, we must assume in this case that the teeth and outer circle of the wheel are true and round and the trouble is that it is off center.

Let me make myself clear: Before starting the job, give it careful consideration from every angle so as not to spoil it, which in the rush to turn out a lot of work has all too often been done. It is reasonable to assume that after removing it from the pinion it cannot be held in a wheel chuck and you cannot cement it on a cement chuck in the regular way. So, the next best thing to do is to turn out a seat in the cement brass just so the wheel will fit into it, and then a little cement will hold it there, and teeth will be running true. Now turn out the center just as little as is required to make it round and then make a bushing to fit the wheel and stake it on. Turn back the seat of the pinion a little farther, because the wheel bushing will be a little thicker than the center of the wheel. Now you can stake the wheel on and with a pair of calipers, true it in the flat and the job is perfect.

My reason for doing it this way is because the chances are that it is the right diameter and any attempt to cut down on the high side would not only be difficult, but would reduce the diameter, therefore causing a complete readjustment, and would be the same as if you put a smaller escape wheel in the watch and then tried to make it work.

THE END

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NOVEMBER

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FEBRUARY 1986

16-17	S	San Francisco, CA	BURCKHARDT

APRIL 1986

20-21	S	Greensboro, NC	BURCKHARDT

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ADDRESS _____

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AWI SEEKING PROSPECTIVE CANDIDATES FOR BOARD OF DIRECTORS

THE COMMITTEE INVOLVED WITH SECURING CANDIDATES TO RUN FOR THE AWI BOARD OF DIRECTORS IS SEEKING RECOMMENDATIONS FROM THE MEMBERSHIP. IF YOU PLAN TO SUGGEST A POSSIBLE CANDIDATE, PLEASE SEND THAT INDIVIDUAL'S NAME AND BACKGROUND TO: MR. ROBERT F. BISHOP, CHAIRMAN, NOMINATIONS FOR BOARD OF DIRECTORS COMMITTEE, AWI CENTRAL, 3700 HARRISON AVE., CINCINNATI, OH 45211.

EACH RECOMMENDATION WILL BE CAREFULLY CONSIDERED BY THE COMMITTEE. CANDIDATES WILL BE SELECTED ON THE BASIS OF THEIR PAST LOCAL ASSOCIATION OR AWI EXPERIENCE, GEOGRAPHICAL LOCATION, PRESENT JOB STATUS, HOROLOGICAL EXPERIENCE, AND WILLINGNESS TO SERVE.

MR. BISHOP MUST RECEIVE ALL RECOMMENDATIONS BEFORE DECEMBER 15, 1985. TO BE CONSIDERED FOR THE 1986 ELECTION.

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

1a. TITLE OF PUBLICATION	1b. PUBLICATION NO.	2. DATE OF FILING
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American Watchmakers Institute, 3700 Harrison Ave., Cincinnati, OH 45211-4724

EDITOR (Name and Complete Mailing Address)

Harold F. Herman, 3700 Harrison Ave., Cincinnati, OH 45211-4724

MANAGING EDITOR (Name and Complete Mailing Address)

Maurice Norrell, 3700 Harrison Ave., Cincinnati, OH 45211-4724

7. OWNER (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given. If the publication is published by a nonprofit organization, its name and address must be stated.) (Item must be completed.)

FULL NAME	COMPLETE MAILING ADDRESS
American Watchmakers Institute	3700 Harrison Ave., Cincinnati, OH 45211-4724

8. KNOWN BONDHOLDERS, MORTGAGEES, AND OTHER SECURITY HOLDERS OWNING OR HOLDING 1 PERCENT OR MORE OF TOTAL AMOUNT OF BONDS, MORTGAGES OR OTHER SECURITIES (If there are none, so state)

FULL NAME	COMPLETE MAILING ADDRESS
None	None

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The purpose, function, and nonprofit status of this organization and the exempt status for Federal income tax purposes (Check one)

(1) [X] HAS NOT CHANGED DURING PRECEDING 12 MONTHS (2) [ ] HAS CHANGED DURING PRECEDING 12 MONTHS (If changed, publisher must submit explanation of change with this statement.)

10. EXTENT AND NATURE OF CIRCULATION (See instructions on reverse side)	AVERAGE NO. COPIES EACH ISSUE DURING PRECEDING 12 MONTHS	ACTUAL NO. COPIES OF SINGLE ISSUE PUBLISHED NEAREST TO FILING DATE
A. TOTAL NO. COPIES (Net Press Run)	9416	9400
B. PAID AND/OR REQUESTED CIRCULATION 1. Sales through dealers and carriers, street vendors and counter sales	None	None
2. Mail Subscription (Paid and/or Requested)	7416	7029
C. TOTAL PAID AND/OR REQUESTED CIRCULATION (Sum of 10B1 and 10B2)	7416	7029
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E. TOTAL DISTRIBUTION (Sum of C and D)	8391	8530
F. COPIES NOT DISTRIBUTED 1. Office use, left over, unaccounted, spoiled after printing	1025	870
2. Return from News Agents	None	None
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11. I certify that the statements made by me above are correct and complete

SIGNATURE AND TITLE OF EDITOR, PUBLISHER, BUSINESS MANAGER, OR OWNER

Maurice E. Norrell, Managing Editor

PS Form 3526, June 1982

PLANS ARE BEING MADE FOR THE

1986 AWI Tour

The mysteries of the Orient will unfold for those who participate in the annual tour of the American Watchmakers Institute which is being planned for September, 1986. The group will visit Japan, China, and Hong Kong, plus many other exciting ports of call. Henry B. Fried, AWI Technical Director, will organize and lead the tour as in the past years.

Transportation will range from the latest jet aircraft operated by Japan Airlines through modern trains, air-conditioned motor coaches, and a sunset cruise of the Victoria Harbor aboard a traditional, high-masted Chinese junk. Tour highlights will run the gamut from a visit to inspect the sophisticated high-tech assembly lines of the Seiko Time Corporation in Tokyo, to a trip to the Great Wall of China (which was constructed between 246 and 209 B.C.!).

Many meals and auxiliary fees are included in the low tour price, which is under $3000 per person. An optional stop-over in Honolulu, Hawaii can be arranged for an additional charge.

The group's size is limited. Some details are subject to later confirmation. However, AWI members and friends are urged to make their reservations now. Write to AWI Tour, P.O. Box 11011, Cincinnati, OH 45211.

Diamond Caresse® Collection



Bulova Watch Company announces some new additions to its Diamond Caresse®collection. Highlighted by diamonds and elegantly modern in every detail, these timepieces have been specifically designed for today's woman who requires quartz accuracy in a high fashion watch.

The classic circle features two dazzling diamonds set on the beaded bezel. This watch is available in both a silvertone case (model 91L09) with a white dial and in all-goldtone with a gilt sunray dial (92J30). Suggested retail cost is from $145 to $195.

For further information contact the Bulova Watch Co., Inc., Bulova Park, Flushing, NY 11370; (718) 565-4200.

SWEST PUBLISHES NEW CATALOGS

Two new catalogs are now available from Swest, Inc. Pictured below is CATALOG 186, which features Swest's complete lines of jewelers' tools, supplies, equipment, metals, etc.

Also available is CATALOG F-86, which provides full-color photographs, etc. of Swest's inventory of jewelry findings and genuine and synthetic stones.

To obtain either catalog, contact: Swest, Inc., Advertising Department, P.O. Box 20938, Dallas, TX 75220; (214) 350-4011.



CATALOG 186 from Swest, Inc.

VIGOR ABRASIVE WHEEL CENTER

B. Jadow and Sons, Inc. announces the availability of their new and interesting "Vigor Abrasive Wheel Center."

This new display center contains a varied selection of Cratex Rubberized Wheels, Adalox Sanding Discs, and Mizzy Heatless Wheels. The units are attractively packaged with clear identification for easy selection.

All units are packed one dozen to the bag and all bags are complete with mandrel. Prices average between $3.50 to $5.00 per dozen wheels.

Look for the Vigor Abrasive Wheel Center at jewelers and lapidary supply houses.



Display center from B. Jadow and Sons, Inc.

PROTECT HANDS WITH GLOVE GUARD FOAM

A hand protective foam that acts like a glove to protect workers' hands has been introduced by Valley Research Systems, Inc. The company says that Glove Guard Foam should be used for hand protection by employees who are continually working manually in maintenance, production, assembly and repair of various production items. Even the secretary who changes ribbons on a typewriter can use Glove Guard Foam.

Glove Guard applies like a shaving lather which is worked into both hands and vanishes from sight, leaving an invisible protective film barrier that Valley says not only protects hands from foreign matter such as dirt, grease, chemicals, oils, paints, stains, inks, varnishes, solvents and other grime, but also leaves hands soft and conditioned.

Simply apply Glove Guard Foam before work and rinse off afterwards.

This product can be sampled in 7 oz. aerosol cans. Write to: Valley Research Systems, Inc., P.O. Box 294, Hewlett, NY 11557; or call (516) 791-6943 and ask for Paul Laurence.



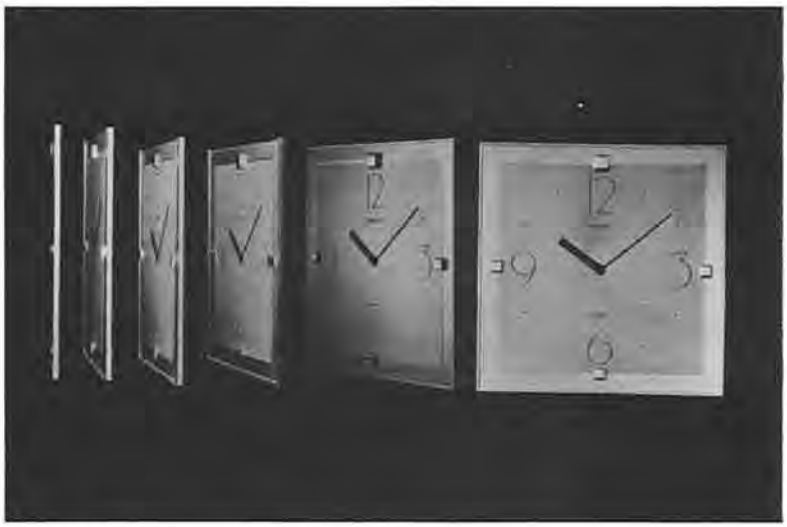
Glove Guard Foam

SEIKO'S NEW ULTRA-THIN WALL CLOCK

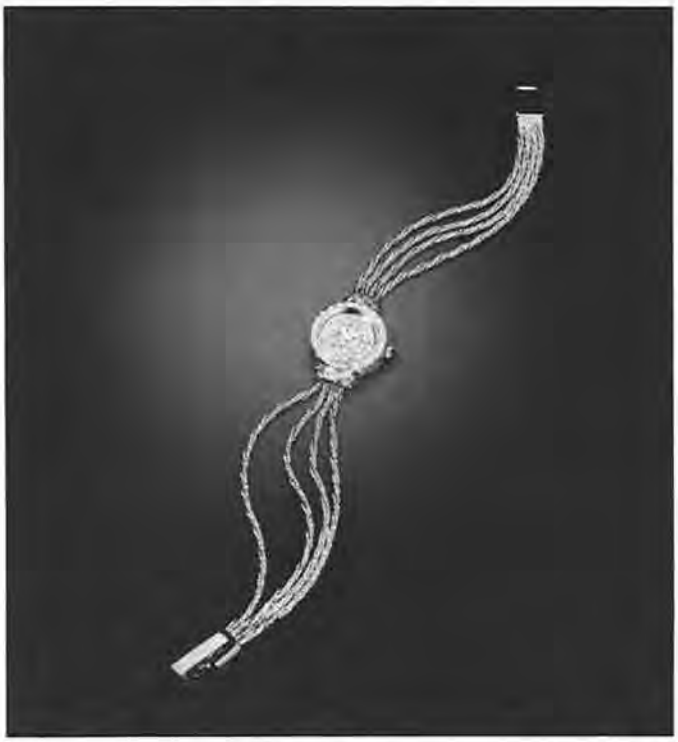
Seiko's new 3/8" ultra-thin (9.6 millimeters) quartz wall clock is believed to be one of the thinnest models available today. In addition, the clock features a 10-year battery life.

Two selections will be available. One will be offered in goldtone, with gilt dial and large, easy-to-read Arabic numbers. The other is available with gray case, dove gray dial and dot hour markers.

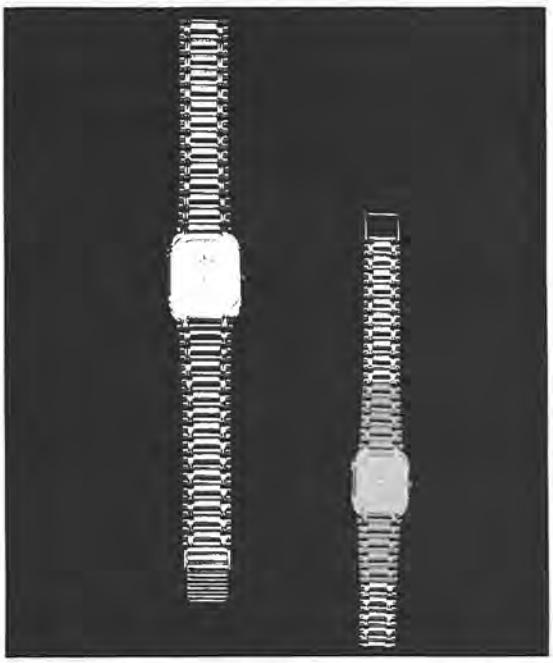
Available from Seiko's nationwide network of authorized distributors.



Seiko's 3/8" ultra-thin quartz wall clock.



The legendary quality of CYMA is world-renowned. The 14 karat gold bracelet watch is exquisitely embedded with diamonds both on its face and case. Style is # 108-175; the suggested retail price is $2,950. Contact: Glenn Corporation, 31 East 28th St., New York, NY 10016.



The rich and luxurious beauty of Jean Lassale is captured by these two new 14 karat gold timepieces. Handsomely crafted, its bracelet connects together with crossbar hinges, complimented by its coordinated dial carrying out the same theme. Hour markers set around a minute track further decorate its dial.

Both men's and ladies' watches are available from Jean Lassale, 640 Fifth Avenue, New York, NY 10019.

CFH Announces its 1986 Store Management Course

Applications are being accepted now for the two-month Jewelry Store Management Course at the CFH Institute in Lausanne, Switzerland, to take place from January 27-March 21, 1986.

The number of places is limited and immediate booking is recommended.

The program is geared especially to ambitious, demanding jewelers who wish to improve their skills in the three major areas of marketing, finance, and staff management.

Participants (average age between 20 and 30) come each year from all over the world to acquire additional knowledge and engage in intensive practical work training. Lectures are complemented by group discussions, simulation exercises, role playing, business games, and case studies. General objective of the course is to increase profitability through better management methods.

Participants who satisfy the Institute's requirements receive the CFH Diploma in Jewelry Store Management.

For information and application forms contact: CFH Institute, Case 206, CH-1001 Lausanne, SWITZERLAND. Tel. 021/20 12 01.



Celebrating the introduction of Lorus Products' new WRISTER line of 21 plastic fashion fun watches are Miss Universe 1985, Deborah Carthy-Deu and Howard Fisher, general manager of marketing, Lorus. Miss Universe greeted retailers at the Lorus booth during the summer Jewelers of America Show in New York. Lorus Products participated promotionally in both the Miss USA and Miss Universe Pageants held recently in Florida.

AJDA/JIDA CO-MEETING MARCH 18-23, 1986

Sanford Rosenberg, president of the American Jewelry Distributors Assn. and Denis R. Gaber, president of the Jewelry Industry Distributors Assn., announce their 1986 conventions will be held as a co-meeting of the two organizations for the first time at the Palm Springs Marquis Hotel in Palm Springs, CA.

While both organizations have individual constituencies that they serve and product lines that differ in some degree, they face many of the same sales and administrative problems and situations which confront all distributors and suppliers in the jewelry industry.

The leadership of both AJDA and JIDA have no intentions to merge, but feel that a co-convention will offer their members new opportunities, will reduce expenses for suppliers and co-members, and through the pooling of resources offer stronger educational programming.

Programming already scheduled for the co-convention will include a morning seminar with

Bruce Merrifield, a dynamic, highly regarded speaker on "Understanding and Marketing Value-added Services." Another entire day will be devoted to a merchandise exhibit program designed to offer sales and marketing program opportunities.

Both organizations are enthusiastic about this first co-convention and the many pluses that can result from meeting together.

VARTA APPOINTS ALLEN GILSON NATIONAL SALES MANAGER

Varta Batteries, Inc. has announced the appointment of Allen J. Gilson as national sales manager.

Gilson will direct and continue to develop the company's sales activities to all classes of trade, including mass merchandising, photographic, hearing aid, watch and OEM, throughout the U.S. and Canada. He reports to Thomas G. Broderick, vice president of sales and marketing.

Gilson joins Varta with 18 years sales, merchandising, and general management experience in the battery industry. He most recently held the position of New England regional sales manager at Eveready Battery Products Division of Union Carbide in Framingham, Mass.

CONSTRUCTION BEGINS ON MUSEUM ADDITION

Construction was begun in mid-August for an approximately 9300-square foot addition to the National Association of Watch and Clock Collectors (NAWCC) Museum in Columbia, Lancaster County, Pennsylvania.

The addition will more than double the present gallery space for its international collection, increase the size of the library more than threefold, and provide more than six times the current storage space. New conservation and registration spaces are also included.

The expansion is being made possible through a fund drive involving the organization's 31,000 members, its 135 chapters, certain members of the horological industry, and local businesses. Construction costs will exceed $400,000. Completion is expected by March, 1986. See photo above.



Present at the ground-breaking ceremony were (left to right): William Elliot, Columbia Borough Mayor; Kenneth E. Brandt, State Representative, 98th District; Edwin H. Parkhurst, Jr., President, Bowman Technical School, Lancaster; Dr. Larry Tice, Executive Director, Historical & Museum Commission, Commonwealth of Pennsylvania; John F. Gelson, President, Hamilton Watch Company; James E. Huber, Chairman, Lancaster County Commissioners; and Warner D. Bundens, Jr., M.D., NAWCC Museum Trustees President.

PJC GEMOLOGY CLASS GRADUATES

Eleven students received certificates for completion of Paris Junior College's professional gemology program recently, according to Malcolm Heuser, gemology instructor at PJC.

Those who graduated included Larry Gene Baker of Jonesboro, AR, Barbara Clawson of Ventura, CA, Daniel LaPorte of Homer, LA, John Milam of Foreman, AR, Tonya Shortes of Lamesa, TX, Geralyn Maron of San Antonio, TX, Grace and Steve Kuvet of Los Angeles, CA, Claude Cleveland of Mobile, AL, Judith Westbrook-Walker of Paris, and Pierre Agharian of Beirut, Lebanon.

The 16-week course in professional gemology is taught three times a year at PJC. The intensive instruction of gemstones and minerals includes theory and laboratory work.

HONG KONG JEWELRY EXPORTS TO U.S.A. GROW

Exports of jewelry from Hong Kong to the United States are enjoying a healthy growth rate in what has otherwise been a slow export year for the territory.

While exports to the U.S. in several areas have dropped, jewelry exports for the first 6 months of this year were 12 percent up on the comparable period in 1984.

Hong Kong jewelry exports to the U.S. last year totalled $160 million, representing just over half of the territory's jewelry exports worldwide.

The Vice-chairman of Tse Sui Luen Jewelry Company, Karl Shin, believes that Hong Kong ranks second or third in value of jewelry imported into the U.S., after Italy and probably France.

ASUAG-SSIH TAKES NEW CORPORATE NAME

At a recent meeting of the General Assembly of ASUAG-SSIH it was decided to change the name of the company to SMH Swiss Corporation for Microelectronic and Watchmaking Industries, Ltd. The headquarters is located in Bienne, Switzerland.

The company produces Tissot, Hamilton, Omega, and the new Swatch watches for sale in the United States.

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

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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, Illinois 60101.

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

Pocket Watch Case Repair. Hunting Case, Bezels, Hinges, dents removed, etc. Tick Tock Specialties, 308 N. McLeansboro St., Benton, IL 62812. (618) 439-6995.

WATKINS TWEEZER RESHARPENING. Tweezers refinished like new inside and out with precision points like Dumont original. $2.50 each, includes First Class return postage. Minimum of 3 tweezers, advance payment required. Harvey C. Watkins, CMW. NEW ADDRESS: P.O. 1402, 1209 Hilltop Dr., Mt. Dora, FL 32757.

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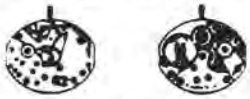
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SCHOOLS

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

OFF CAMPUS COURSES IN WATCH REPAIR, ENGRAVING, DIAMOND SETTING OR CLOCK REPAIR. Learn a profession through innovative, self-paced instruction at home. Contact KANSAS CITY SCHOOL OF WATCHMAKING, 4524 Main St., Kansas City, MO 64111. Phone: (816) 931-5522.

Dates To Remember

NOVEMBER 1985

14—Antique and Fine Jewelry Auction, Christie's East, 10 AM; 219 East 67th St., New York, NY 10021.

16-17—Common Sense Quartz Watch Repair Bench Seminar; New Philadelphia, OH; Bishop, instructor.

26—Clock and Watch Auction, Christie's, London.

DECEMBER 1985

12—Fine Jewelry Auction, Christie's East, 10 AM; 219s East 67th St., New York, NY 10021.

FEBRUARY 1986

7-11—INHORGENTA '86; Munich Trade Fair Center; Munich, West Germany. Information: Kallman Associates, Five Maple Ct., Ridgewood, NY 07450-4431. Phone: (201) 652-7070.

16-17—Management Seminar (AWI); San Francisco, CA; Burckhardt, instructor.

MARCH 1986

1-5—Frankfurt International Fair.

APRIL 1986

17-24—European Watch, Clock and Jewellery Fair; Basle, Switzerland.

20-21—Management Seminar (AWI); Greensboro, NC; Burckhardt, instructor.

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