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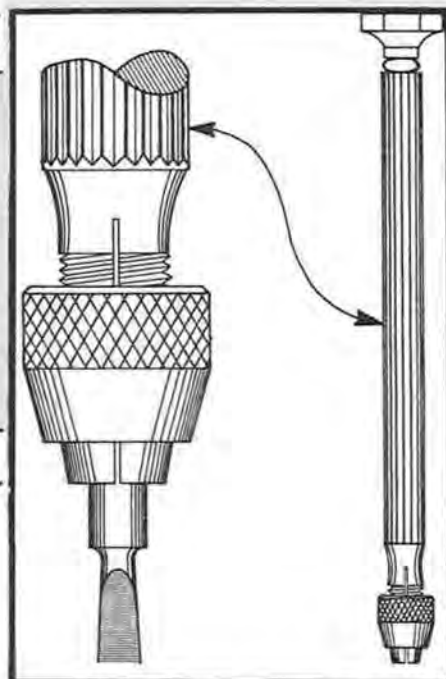
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THOROLOGICAL**S**TM **IMES**

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Editorial

Almost all watchmaking schools can prepare a student for a position in the micro industry. Large corporations have, since the late forties and early fifties, sought out and placed many persons who have had watchmaker training. The marriage has been good. Many watchmaker-oriented people have found the fringes and the compensation rewarding.

There are other prospective students who are seeking the complete and traditional accomplishment of the true skills of the trade. These people are the entrepreneur segment of the industry. Success or failure lies solely in their hands, and they would have it no other way. The beginning of this road is the selection of the watchmaking school that will give the traditional courses of bezel jewelry, the lathe, etc., that will properly prepare them for the much sought-after skills.

The person who has decided on this profession should give serious thought to which road they wish to travel.

On the Front

This month's cover is from Nancy Stefka of Racine, Wisconsin, whose photo is of a vast landscape in the Rocky Mountain National Park in Colorado.

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PRESIDENT'S MESSAGE...

Fred S. Burckhardt



Make a Good Choice

All the newspaper ads are shouting nothing but discount prices, anywhere from 50% to 80% off. Those of us in the business know these super-saving prices are fictitious. Hopefully, those who do business this way will be found out sooner or later. The sad thing is, this low type price effect is spilling over into the trade magazines in ads placed by some of those seeking trade work. Maybe it's me, but I just can't understand anyone advertising that they have the lowest prices for repair work. Anyone who has the skill and does quality work, should never have to resort to such tactics.

I've seen several repair price surveys recently and must admit they were quite surprising. There are those who are still charging less for their work than some of us were getting 30 years ago. Does this mean that we are better craftsmen? Not necessarily. I think it does mean that some are better business people than others. In any business, if you go into it and play for peanuts and win, the only thing you'll win will be peanuts because that's all you played for. Many times while talking with those who own their own shops, they remark about how much business they did the past year. But for some reason they never say how much of the money they took home. The bottom line is what counts—after you've paid all the bills and the rest of the overhead. You could be doing a million dollars worth of business but if you're only taking home ten thousand dollars, you had better do some serious thinking.

Remember, you are where you are today because that's where YOU choose to be. We were all blessed with some talent. Use your talent, skills, and ability and choose to be the best at whatever you do. If this be your choice, you won't have to worry about playing for peanuts anymore.

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RENATA 52	4.75	343	.38	387	.53	1620	.75
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186	.48	350	.67	389	.37	2025	.67
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303	.64	362	.38	394	.42		



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Questions & Answers

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



Some Questions On Clocks

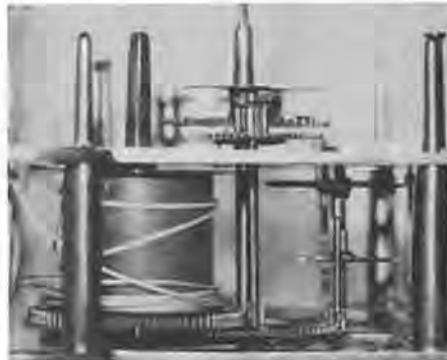
I have just read your column in the November 1985 *Horological Times* about pendulum bob locations. I recently experienced this problem while restoring a pillar and scroll clock that had its original movement replaced with a Seth Thomas spring wound brass movement. In this case the bob was 2 inches above the glass window. I was able to resolve this nicely by removing the pendulum suspension mounting pin and remounting it 2 inches lower. Then a new crutch wire was made, also extending it by approximately the same amount. The results were quite satisfactory and I would recommend this method for lengthening pendulums, when appropriate.

John Liggett
Grenada, MS

Q I have in my shop for repair and restoration a customer's clock, and I am at a loss to determine the original configuration of the gathering rack, warning detent, and locking. I can find no drawing or references in my library. I am given to understand this is called a St. Christopher clock.

Can you supply me with any information of this movement? I hope the photographs help you to identify the movement.

John Wincn
Sunnymead, CA



A Your movement is most likely German of the last century and while no drawing or photographs of the exact type exist to my knowledge, the problem of "doping" out the missing parts should not be difficult to a person of your attainments.

I am enclosing a photocopy of a page from Jendritzki's book on pendulum and striking clock repairs. In this you will learn how the rack can be made when only the snail is available. As you can see the pitch circle of the rack must extend from its center (its mounting arbor or shaft) to the pitch circle that you decide for your gathering pallet. The upper black silhouettes show the locking device for the rack and the stop arm as well as its extension into the hole in the front plate to catch the pin on the warning wheel. Try to make at least 16 teeth to the rack. The tail is most often half the radius of the rack itself so that there is a direct relationship to it. Follow whatever text you have with this sheet. Should you desire the rest of the text, borrow the book from the Cincinnati AWI Central library. You will become the technically richer as a result of this experience and you will find that it isn't very hard to do.

The tail on your lifting lever which does the unlocking for the strike has a hole at its extreme left. This often had a string with a light weight so that the strike can be tripped by a pull of that string. It is not a repeat mechanism but does help in testing. I do not notice but one pin on the warning wheel and none on any other wheel, so your rack may have to be designed so that it supplies both the method of keeping the warning stop extension clear during striking and a final locking at the end when the rack lock drops off the lowest gathering tooth.

Q I have some questions concerning two clocks which I have recently taken in for service. Your advice would be most appreciated.

The first is a two-sided clock, which I think was at one time battery operated. The case is of solid oak, and is hinged at the top so that each side may be opened. In the top are also two holes by which the clock could be hung. The

(Please turn to page 16)

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978.003

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5 1/2 x 6 3/4 L x 3.6mm
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Replaces 961.001.

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MIYOTA 2030

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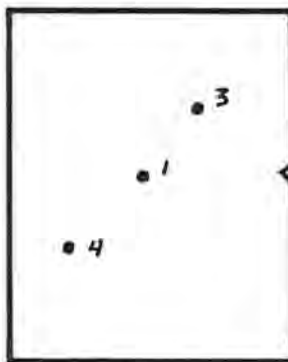
Positioning the Dial

One of the problems encountered when attempting to retrofit a quartz movement to an older case is the problem of positioning the dial. The first thing you want to do is check the information available from your supplier of quartz movements to see if any of the quartz movements have the same dial post positions as the movement you are discarding. If you are not lucky enough to find a replacement with the same dial post positions, you have a number of options.

The most obvious option is to send the dial to a refinisher and have the dial posts repositioned, and the dial refinished. This is the most expensive option. Others use the double-sided adhesive dots or strips which are available from material houses, then after removing the dial feet they position the adhesive material in a place on the dial side of the pillar plate which will not interfere with any moving part. The other side of the adhesive is then exposed and the dial pressed into position. You will need to supply a dial washer if there isn't one already in place. Others have used double-sided adhesive tape in the same manner.

If the job is to be performed on a watch of considerable value, you will want to reposition the dial posts in their proper places. You can do this if you have one of the electric dial post soldering machines such as Buddy Carpenter will show you in his new AWI course on retrofitting. There

are several commercial models of these machines available for those who do not want to make a do-it-yourself project out of it. With a little practice you will be able to reposition the dial posts to their proper place and you will not mar the finish on the dial.



(Please turn to page 10)

- 1—Opening for the cannon pinion.
- 2—Stem location.
- 3 & 4—Dial post positions marked with a small pivot drill.
- 5—Cut the new dial posts to the proper length, being very careful that they do not protrude into the coil or some other vital part.
- 6—Install the dial onto your new quartz movement.

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BFG 888	\$16.00	Handok 820	\$30.00	2105	\$16.00
EJ 30	\$16.00	Harley/Ronda 377 (day at 3:00)	16.00	2115	\$16.00
ESA 551.111	\$16.00	672	\$16.00	3225	\$16.00
555.412	\$16.00	872	\$16.00	Pulsar V236	\$14.00
561.101	\$16.00	R1177	\$16.00	Y112	\$13.00
579.001	\$16.00	R1377	\$16.00	Y121	\$13.00
9182	\$16.00	3572	\$16.00	Y432	\$18.00
9222	\$13.95	3672	\$16.00	Y480	\$16.00
927.102	\$16.00	3772	\$16.00	Y481	\$12.00
928.411	\$16.00	3972	\$14.00	Y572	\$16.00
935.312	\$16.00	3975	\$12.00	Y573	\$16.00
940.111	\$16.00	ISA 1198	\$16.00	Y590	\$16.00
944.132 (Y23A)	\$16.00	Miyota 2N50	\$30.00	PUW 432	\$16.00
944.132	\$16.00	2Y50	\$16.00	683A (Alarm)	\$16.00
951.111	\$16.00	3N20	\$16.00	801	\$30.00
960.111	\$16.00	3T00	\$16.00	900	\$16.00
961.001	\$10.95	3T10	\$16.00	910	\$16.00
961.101	\$16.00	2005	\$16.00	Remax 1910	\$12.00
963.115	\$16.00	2015	\$16.00	6641	\$16.00
965.112	\$16.00			Rico 0190	\$16.00
965.312	\$13.00			580	\$16.00

MIYOTA IDENTIFICATION



2N50



2Y50



3N20



3T00



3T10

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Battery News

by Ewell Hartman, CMW

BATTERY NUMBER SYSTEM

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

Section II - Specifications and Cross-Reference

AWI, S19: Add to Duracell, D399
 AWI, S19: Add to Saft, BS35
 AWI, S23: Add to Duracell, D361
 AWI, S18: Add to Duracell, D371
 AWI, S18: Add to Saft, BS30
 AWI, S32: Add to Duracell, D377
 AWI, S32: Add to Saft, BS37
 AWI, S34: Add to Duracell, D321
 AWI, S38: Add to Duracell, D315
 AWI, S38: Add to Saft, BS40
 AWI, S40: Add to Duracell, D373
 AWI, S44: Add to Eveready, ***333
 AWI, S44: Add to Renata, 333
 AWI, S56: Add to Duracell, D379
 AWI, M02: Add to Varta, V313
 AWI, M02: Add to Toshiba, MR-44
 AWI, M02: Remove from Yuasa, MR-44
 AWI, M02: Remove from Yuasa, H-C
 AWI, M04: Add to Varta, V323
 AWI, M06: Add to Varta, V325
 AWI, M10: Add to Varta, V354
 Page 16, Footnote: ***Sony/Eveready (new)

Mr. Henry Kessler of Renata U.S. contributed much of this month's "Battery News"

"ENTHUSIASM MAKES THE DIFFERENCE"

TIME

BENCH TIPS

(Continued from page 8)

The problem of locating the exact position of the new dial posts can be solved by using several methods. The one I believe to be the most practical is the one Henry Fried discussed with the Kansas Area watchmakers several weeks ago. Here is that method:

You can use a regular business card, but even better a piece of mylar, a clear plastic available in art supply stores, to make a template to locate the proper dial post positions.

1) Make a hole in the template just large enough for the cannon pinion to fit through. Place the template over the cannon pinion, then notch the stem position at the proper location.

2) Turn the movement over with the template in place and using a small pivot drill go through the dial post openings on the pillar plate. Twist the drill just enough to mark the position on the template. In some cases it will be necessary to remove some components in order to safely insert and twist the pivot drill.

3) Now position the template over the backside of the dial, after the dial posts have been removed. Be sure that the stem notch is aligned with the "3" position on the face of the dial. Using the pivot drill, mark the dial so you will be able to place the new dial posts in the proper position. A careful twisting of the drill will not only mark the correct spot, but it will create a small reservoir for the solder.

4) Select a piece of copper wire of the proper diameter to serve as the new dial posts.

5) Using the electric dial post soldering machine solder the posts in place. If all components are clean you should get a good bond between the dial and your new dial posts. The original finish on the dial will not be marred.

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TIME



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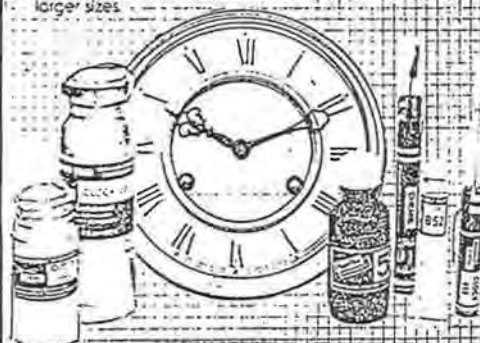
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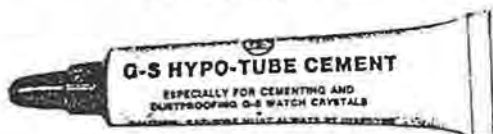
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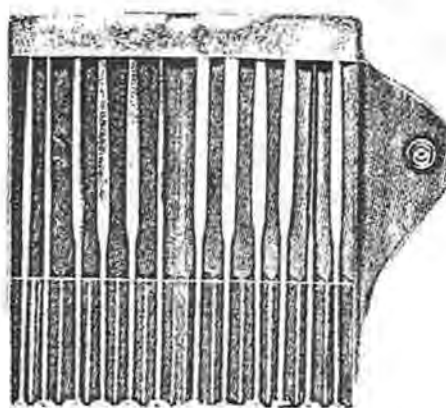


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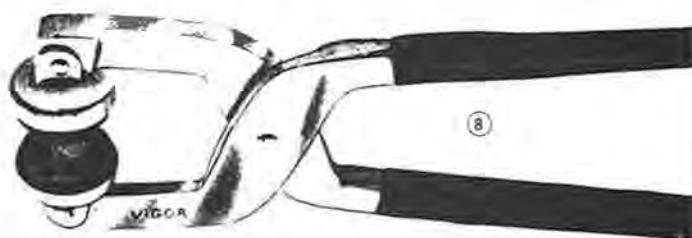
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Archie B. Perkins, CMW, FNAWCC
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Part III

A problem often encountered in antique watch restoration is the removal of a broken screw in a watch plate, bridge, or a barrel arbor. This problem is not always easily solved. Sometimes different methods must be used before a broken screw can be removed successfully. Care must be exercised when removing a broken screw so as not to damage the plate or barrel arbor that holds the broken screw.

One method that can be used for removing a broken screw from a watch plate is by using the screw extractor. Figure 1 shows the Bullock screw extractor. View A shows the frame of the tool. View B shows the two extractor screws that are specially shaped on their ends. View C shows the two lock nuts which are used to lock screws B into position. View D shows a special screw for the tool. The end of this screw is

shaped like a screwdriver blade and it is used in the screw extractor for removing a screw that is frozen in a watch plate (not broken).

The Bullock screw extractor was made and available in the early 1900s. This extractor is not available now, but one may show up in some old tools from time to time. A screw extractor that is available now is the Bergeon screw extractor, Number 30209, which is available from your watch material distributor.

The following procedure is followed when using the Bullock screw extractor. See Figure 2. The screw extractor is placed in the bench vise. Use cardboard or thin pieces of wood in the vise jaws to protect the frame of the screw extractor from the serrated vise jaws. Next, back up the two lock nuts until they are against the heads of the extractor screws.

Figure 1

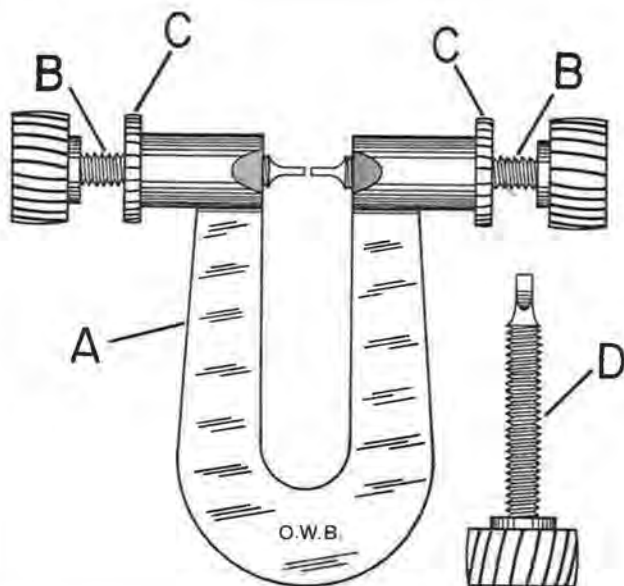
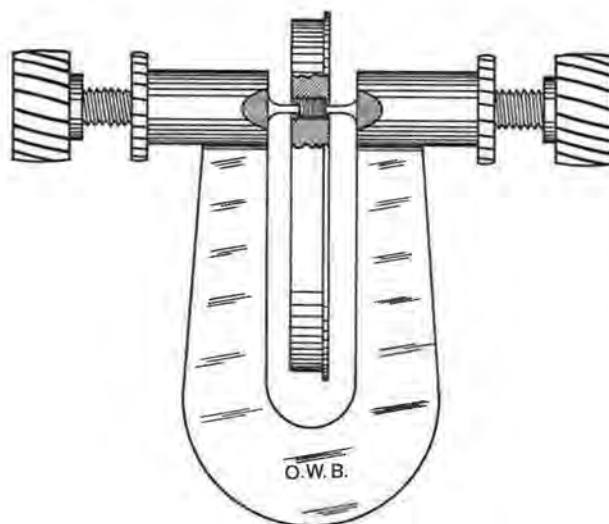


Figure 2



Then back up the extractor screws until the watch plate which has the broken screw will go between the ends of the extractor screws. Now place the plate between the points of the extractor screws with the broken screw centered with the points of the extractor screws. Next, advance the two extractor screws until they tighten up on each end of the broken screw. Then the two lock nuts are advanced and tightened against the frame of the screw extractor locking the two extractor screws into position against the ends of the broken screw. Note: The ends of the extractor screws should be centered on the ends of the broken screw. Also the watch plate should be centered in the frame. If the ends of the extractor screws are too large to enter the hole in which the screw is broken off, then they must be turned down in the lathe so they will enter the hole and reach the ends of the broken screw. After the extractor screws are tightened against the ends of the broken screw and are locked into position with the lock nuts, then the watch plate is turned in the frame of the tool in a direction which will back the screw out of the hole in the plate.

When removing a frozen screw with the screw extractor, the extractor screw which has a screwdriver shaped end is used in the frame in place of one of the pointed ended extractor screws. The extractor screw with the screwdriver end goes into the slot of the frozen screw and the other extractor screw goes against the end of the screw.

The screw extractor has its limitations in removing broken screws. One limitation is that it cannot be used to remove a broken screw if the hole with the broken screw does not go all the way through the watch plate. Another limitation is when the broken screw is a stud screw or dial foot screw where one end of the screw cannot be clamped with the

screw extractor. Still another limitation is when the watch plate is too large to pass through the frame of the screw extractor. Therefore, other methods must be used at times when removing broken screws.

Sometimes removing a broken screw is a very simple procedure, especially if the broken screw is loose in its hole. In this case, a sewing needle can be placed in a pin vise and used to work the broken screw out of its hole. The sharp point of the needle is rubbed around the edge of the screw in a direction that will back the screw out of its hole. If the screw is broken off leaving a jagged edge on the screw, the point of the needle can be used on the jagged edge with good results. The point of the needle is used on the broken screw with very little pressure. If much pressure is used with the needle against the broken screw, the screw will be crowded against the side of its hole causing so much friction that it will be difficult to turn the screw. In other words, the broken screw is jiggled out of its hole with the sharp point of the sewing needle. If the screw cannot be backed out of its hole, then it may be easier to jiggle the screw all the way through the hole if the hole is threaded all the way through the plate. If a broken screw extends from the plate enough, it can be clamped with a balance screw holder and unscrewed from the hole. It is advised to use an old damaged balance screw holder because a steel screw thread can damage the inside of the jaws of the holder which could scar the head of a balance screw when used for removing and replacing balance screws.

Another method that can be used for removing broken screws is to drill a hole through the center of the broken screw, as is shown in Figure 3, and then a cutting broach is wedged into the hole and the broken screw is unscrewed from the hole in the plate. This is shown in Figure 4. This method is used in machine shops for removing broken screws. Instead of using a broach, they use a tool called an ezy-out. Therefore, the cutting broach serves as an ezy-out for the watchmaker. Note: It is very important that the drill used is not so large that it damages the threaded hole in the watch plate and that the hole be drilled in the center of the screw. Sometimes when the hole is being drilled, the drill will get caught in the screw and turn the screw through the hole removing it from the hole. In order to start the drill on center, a small center punch can be used to spot a center for the drill. This method of removing a broken screw is excellent to use for removing broken balance screws or any brass screws. Sometimes steel screws are too hard to drill unless a carbide drill is used. The holder for the drill is a small pin vise which has a screwdriver head frictioned into its end. When drilling the hole through the broken screw, the drill holder is used by hand like a watch screwdriver is used. (See Figure 3.) The broach can be of the knurled handle type or a regular style with a pin vise used as a handle for the broach.

Another method used for removing steel screws when the screw hole does not go through the plate is to boil the screw out with alum and water. This can only be done when the steel screw is broken in a brass or nickel silver plate. The action of the alum attacks steel but will not attack the brass or nickel silver. If a steel screw is broken off in a steel piece, this method cannot be used. For example, if a screw is broken off in a barrel arbor or a steel lever, then it cannot be boiled

Figure 3

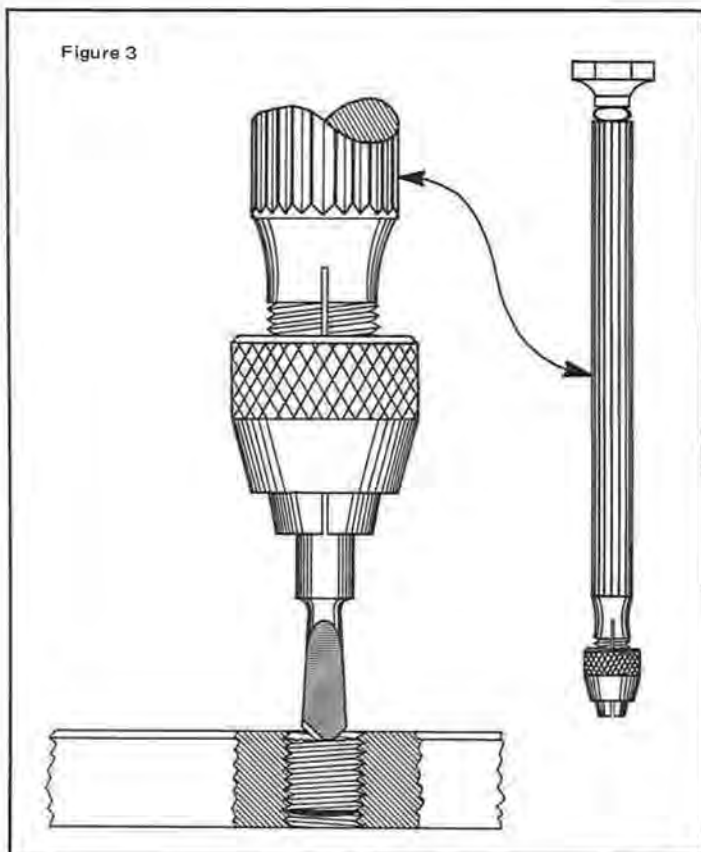
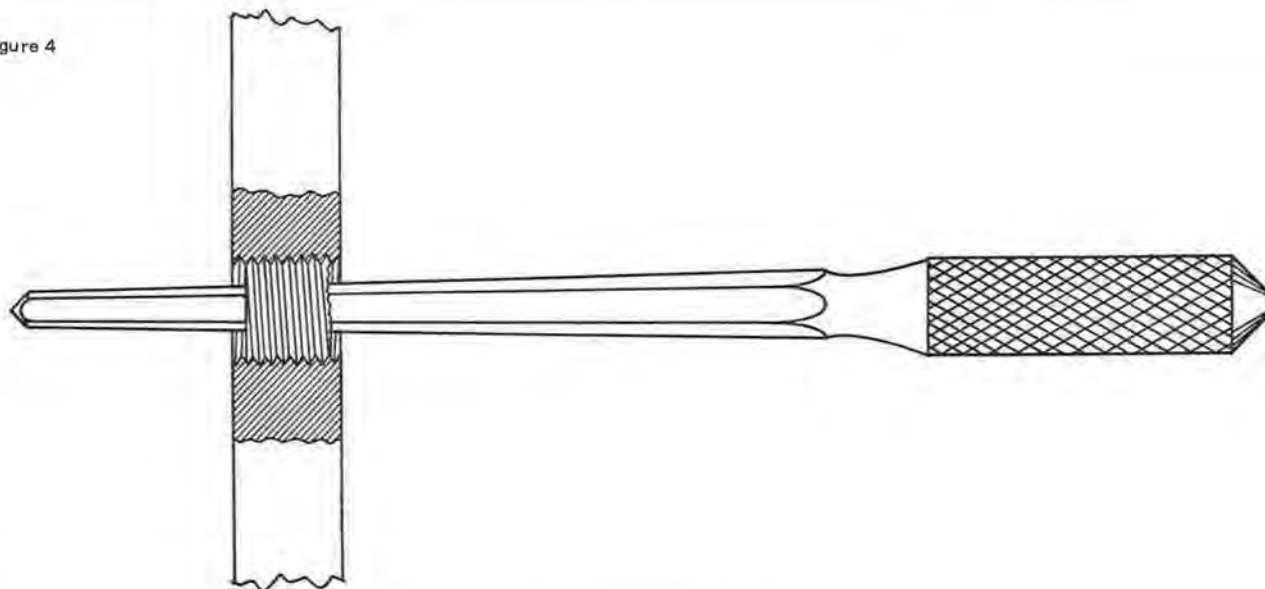


Figure 4



out with alum and water. To boil a screw out of a watch plate, the following procedure is used. Remove all steel parts from the watch plate. Then select a pyrex beaker large enough to accommodate the watch plate. Now place the plate in the beaker. Add enough hot water to the beaker so the watch plate will be well covered. Then add some alum to the water. The alum may be obtained from a drug store. The stronger the solution, the faster it will act on the broken screw. After this, the pyrex container is heated on a hot plate or over an alcohol flame so the solution maintains a slow boil. This boiling action in the alum-water solution will gradually rust the screw out of its hole. It usually takes about one hour to boil out most screws. The watch plate should be removed from time to time and the broken screw checked with a needle to see the progress that the solution is making on the broken screw. Note: If the solution starts getting low in the pyrex container and water needs to be added, **DO NOT ADD COLD WATER** as this is likely to break the pyrex container. Remove the container from the heat and then add some hot water slowly to the container. This method of removing broken screws works very well with broken stud and dial foot screws.

REMOVING BROKEN SCREWS FROM BARREL ARBORS

When a screw becomes broken off in a barrel arbor, first check to see if the end of the screw extends far enough from the end of the arbor to grasp with an old balance screw holder. If this is the case, then a balance screw holder can be used, as is shown in Figure 5, to remove the broken screw.

If the screw is broken off flush or below flush with the end of the arbor, then try to back the screw out of the arbor with a sewing needle. If this method doesn't work, then the next method can be used. This method is shown in Figure 6. The arbor is chucked in the lathe and a sharp pointed graver is used as shown to hold the screw while the lathe head is turned by hand in the direction of the arrow to back the screw out of the hole in the barrel arbor. Figure 6 shows a screw with a right hand thread being removed. If the screw should have a left thread, then the graver point would be placed to the left of the center of the broken screw and the lathe head turned in the opposite direction. If the screw should be frozen in its hole and cannot be removed by this method, then, as a last resort, another method can be used. This method is shown in Figure 7. In this method, a slot is sawed across the center of the square on the arbor. At the same time, a slot will be cut in the end of the broken screw so a small screwdriver can be used to remove the broken screw. Usually the barrel arbor is too hard to be sawed without annealing or tempering its end. Usually a high speed circle saw is used for sawing the slot after the arbor has been annealed. To avoid having to anneal or temper the arbor, a solid carbide circle saw can be used to saw the slot. Carbide circle saws can be bought from machinery supply houses. A diamond saw can also be used to saw the slot. A diamond saw can be made from a thin circle saw blank or an old annealed circle saw after the teeth have been removed with a graver. The diamond compound is rolled into the edge of the disc with a hard steel roller while the disc is

Figure 5

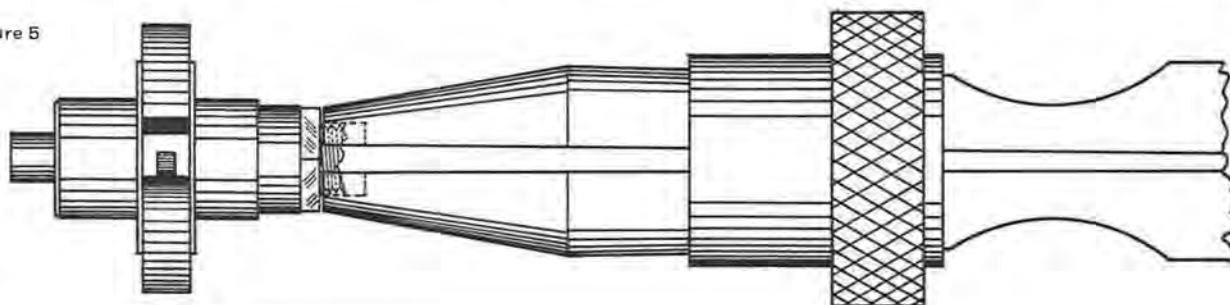


Figure 6

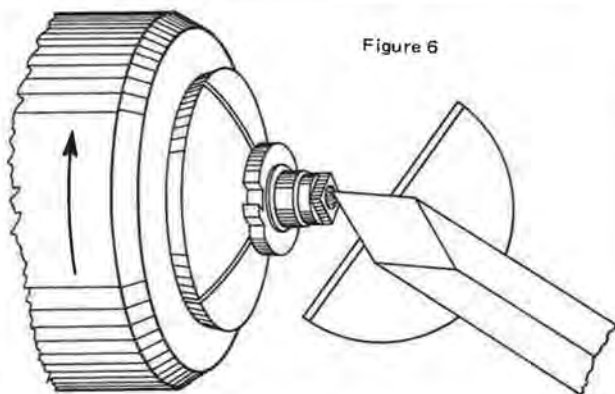
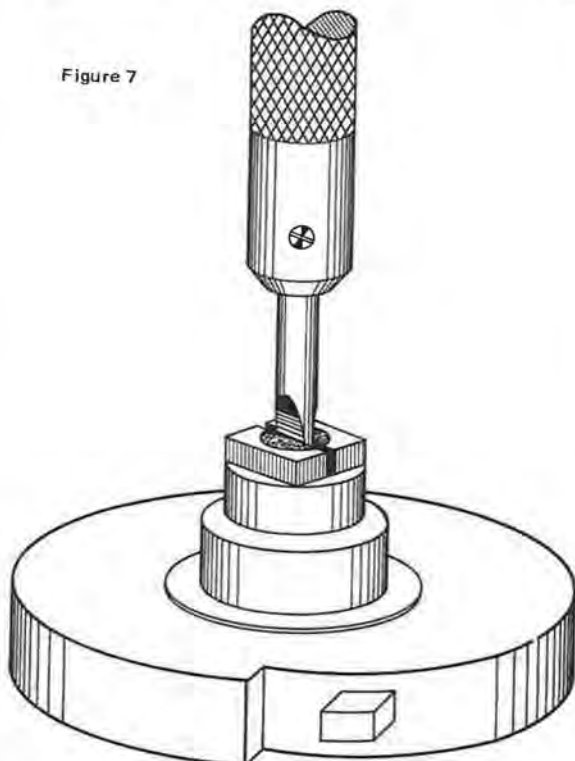


Figure 7



mounted on its arbor chuck in the lathe. The diamond saw is kept damp with kerosene while the slot is being sawed in the end of the arbor. The barrel arbor can be held in a square

(Please turn to page 21)

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QUESTIONS AND ANSWERS

(Continued from page 6)

dial has the name "International" printed on it. The identification tag on the inside has the following information:

Order number 30724
Serial number 596195
Style number F.H. 561-2
Voltage 24vdc, 6w
Date: August 29, 1940

The patent date on this clock is July 22, 1919, and it was manufactured by International Business Machines Corporation (IBM). My question on this clock is what type of batteries were used, and is it possible to obtain them? If the batteries are not available, what would be your suggestion? I assume that this clock was at one time used in an office or perhaps in a department store where the time could be told from either direction.

The second question I have is in regards to a German-made grandfather clock. The clock stands about 7 ft. tall. The owner said it was purchased in Germany by his father about 15 years ago. The owner was told that it was about 100 years old. I wasn't sure about the age of it, so I thought it best to keep silent.

The front plate is held down with pins, while the back plate is fastened with screws. It has a rack and snail striking mechanism. The pendulum is 29 inches long with a 6½" bob.

Could you give me any information about the maker, approximate age, or any other facts pertaining to this time-piece? The drawing below was taken from the back plate.

Daniel C. Jackson
Pendleton, IN



Plate approx. 6⅜" x 6⅜"

A The IBM clock can be revealed to you in detail by applying for the patent copy from the patent office or from the IBM Company. The patent dates should make that simple. From that, details can be had. They marketed many such clocks which were used mainly for industrial use.

As for batteries, two 12V batteries in series should supply the voltage necessary, if the clock is in good running order. Else, use a variable power supply, DC supplying the 24 volts and then reducing the voltage to discover the low voltage point at which the clock will fail to run. Increase the voltage above 24V if needed to get it running; then reduce it again. Also measure the current consumption at the best running voltage level to learn just how large a dry cell package you need.

As for the German clock, I recognize the trademark as that of Leon Furtwangler & Son (LFS), of Furtwangen, Germany. They are no longer listed in current German Buyers Guides. The company was in business over a hundred years ago so the claim of a century-old clock is possible.

Henry B. Fried

Q Please assist me in the identification of the maker and time era of this grandfather clock. Here are some details on its description:

The rear wooden plate has number "154" written at the top, and a little lower appears "No. 25." Below that are the initials "LB." The very same markings are on the rear of the case and also on the back of the pendulum.

A wooden side cover for the movement has "Lt. 13/11 1888 Rierte," which could be a repair date (?).

The case (93" x 21" x 11½") is made of oak. Examination shows only wooden pegging used throughout the case. Door hinges are made of brass, and they appear to be handmade. The lock (steel) has an ivory key.

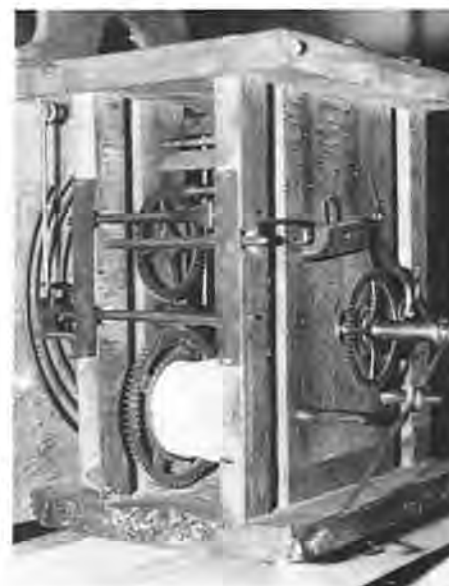
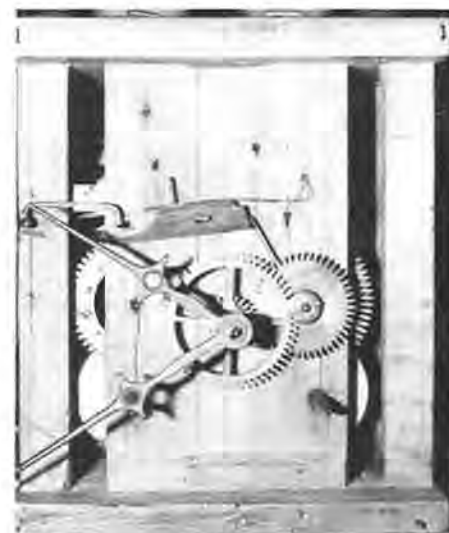
The pendulum rod is suspended from the top of the movement by wire, much like what we find in cuckoo clocks.

The escapement is that appears to be the standard rebound type.

A former owner glued a paper on the rear of the case with his name and German address. Information is that the clock was in Germany before being brought to this country and sold. I feel that it is most likely from the Black Forest.

The face is original hand-painted with identical markings found on the movement.

Willard Fox
Boone, NC



A Your clock is an excellent example of a Black Forest clock, made in a province of Germany located in the Rhine region in a triangular area between Switzerland, France, and Germany, whose capital is Freiburg. They were made as early as the end of the seventeenth century and well into the late nineteenth century. The earliest clocks had wooden plates arranged with one train behind the other; more recent ones had the trains next to each other. The earlier clocks had wood arbors, with lantern pinions having wood shrouds. The clocks usually were designed for wall hangings, with an added rear 'plate' as in your clock, having a hole in the upper curved portion for the purpose. In your clock, a case was made (possibly later) for housing the movement.

The dials (of wood) painted with various designs including flowers, and the characters painted onto a craved, raised ring give to the dial a thicker form, not an overall flatness. In the photos of your clock the dial is in excellent condition, showing slight chipping only at the edges. This could have been better preserved because of the protection offered by the case.

The other features you recognized, including the pendulum suspension, side movement panels, strike control levers and wires, gong, recoil escapement with strip pallets, are not only characteristic of clocks such as yours, but exist also in cuckoo clocks which were made in the same region in Germany, and in fact, which descended from clocks of your style by adding the cuckoo, the quail, and even the music box.

The markings you have deciphered on the movement, dial, and case could be identification numbers, repair initials, and dates. I do not find in my map any villages or towns which could identify the exact region of manufacture. Only infrequently have names been painted on the dials.

The weights, often shells filled with lead shot, suspended by cords directly from the winding drums of wood, wound with cranks slipped over winding squares, the pendulum rod without suspension spring, flattened at the upper end and looped over a swinging 'u'-shaped suspension are not only characteristic of clocks of your type, but also of cuckoo clocks, again showing their common ancestry. The shape of the hands is

also quite distinct.

The one request difficult to answer is the date of manufacture except to recognize that it is in excellent condition, and has many later design features indicating that the clock dates to the more recent period of manufacture, probably mid-nineteenth century. If a maker's name could be found, along with the village or town where the work was done, a closer estimate could probably be made.

I have restored many of these clocks over the years. They were well made, and in spite of much wear, will continue to run for many more years. Many of these clocks appear to have been hand made using simple tools.

Joseph G. Baier
CMW, CMC

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Battery Clamps

As we know, battery clamps or battery straps of some sort are needed on many of our quartz watches. Sometimes they are lost or broken and need to be replaced. If it is a brand name watch we can order this part by the watch model number, case number, or translate this into the exact parts number. However, if we have an off brand watch and we cannot even find a number, or a low grade watch for which parts are not available, then we must make this part.

Unfortunately today many of our quartz watches are repaired by, or we should we say repairs are attempted by the corner drug store, grocery store, or other unqualified persons. Of course this does not include the true watchmaker who may have a department in one of these stores. Last but not least on our list of noncraftsmen are OUR customers themselves. With these people come the very high risk of losing a cell strap or a cell strap screw, etc.

MAKING A BATTERY CLAMP

Making any part should only be done if a factory new one is not available. Making a battery clamp without a sample is a little difficult but not impossible. By observing the module we should first determine if this strap or clamp goes completely across the battery as in Figure 1-A, or only part way as in Figure 2-A. Battery clamps that are held on both ends with screws or other clamping methods may be made of thinner stock than the partial strap (see Figure 2). The partial straps need to be more rigid because they are being held by only one screw.

The material used may be from an assortment of cell straps purchased from our watch material supply house. Although there is a slim chance of finding one to fit from this assortment, it is good to have these as sometimes we can choose one close and alter it to fit. If necessary, we can make this completely from pieces of brass purchased from a local hobby shop or hardware store.

Figure 1

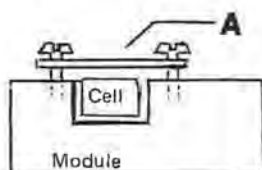


Figure 2

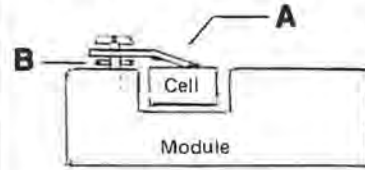
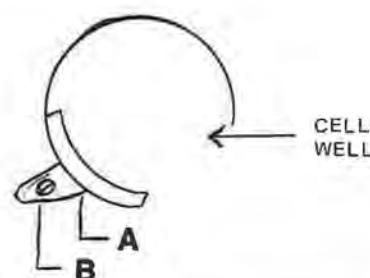


Figure 3

M.M.	INCHES	M.M.	INCHES
.15	.016	.15	.006
.25	.010	.24	.0095
.33	.013	.29	.0115
A Thickness of our stock sizes		B Potential sizes needed	

Figure 4



My stock of brass used for this purpose consists of the following three pieces: one piece of brass, 12 inches by 1/2 inch by .013 inches (.33mm); one sheet of brass, 10 inches by 4 inches by .010 inches (.25mm) thick; and one assortment brass shim stock, 6 inches by 4 inches which included one piece .006 inches (.15mm) thick. This gives us a lifetime supply of some very useable sizes, at a cost of less than three dollars. Figure 3-A shows the sizes we have with this stock as compared to some of the sizes that seem to be needed. We realize, of course, we can obtain any desired in between thickness by filing and then stoning down (or otherwise thinning) our stock to finish our battery clamp.

Comparing Figure 3-A to 3-B, we see our chosen stock pieces in Figure 3-A is ample to cover the potential needed sizes shown in Figure 3-B. Note the thickest sizes

are generally needed only for a two battery module or where a special clamp goes all the way across the diameter of the module and snaps into grooves on both ends. The top and middle ones on our chart (Figure 3) are the most needed.

Some battery clamps do not fit over the cells well (Figure 4). These are not as likely to be lost since they are not removed during the cell replacement. However, if lost or broken they can be made from one of our stock pieces, but we need to bend them to form a 90 degree angle as shown in Figure 4-A. A small hole is drilled at B to allow a screw to hold this clamp firmly to the module.

CUTTING STOCK MATERIAL TO FIT

Cutting material to fit is easier with a sample (even a broken one), however as we said, many times, the battery clamp is missing and we must make some good guesses. Let's suppose we need a clamp to fit across the cell. Two holes are needed, one at A and one at B, as shown in Figure 5. We should first cut a rough piece to approximate size and drill the two holes (Figure 5-C). Or maybe we need to cut a slot (Figure 5-D) to allow one end to hinge (to release). This fitting should be done first and then the final shape obtained by cutting, filing, etc.

If we need a cell strap like Figure 2, it may be necessary to insulate it as shown at B in Figure 2. In this module design, we certainly do not want to make this strap longer and connect on both sides of the cell, as this would result in a short. To see if this insulator is necessary, it may be helpful to use our meter, setting it to OHMS, and make a continuity test. First touch the probes together to test our setup and the meter should read zero. This is a short and we know our meter is set properly and is working. We now place one probe in the cell well and the other probe on our newly made cell strap. If our meter goes to zero then we have a short and

this indicates the need for an insulator. We can either use a factory insulator or make one from a piece of thin plastic (or mylar plastic) and place it between the plate and cell strap as shown in Figure 2-B. We may also need a tube-shaped plastic insulator to place over the screw hole.

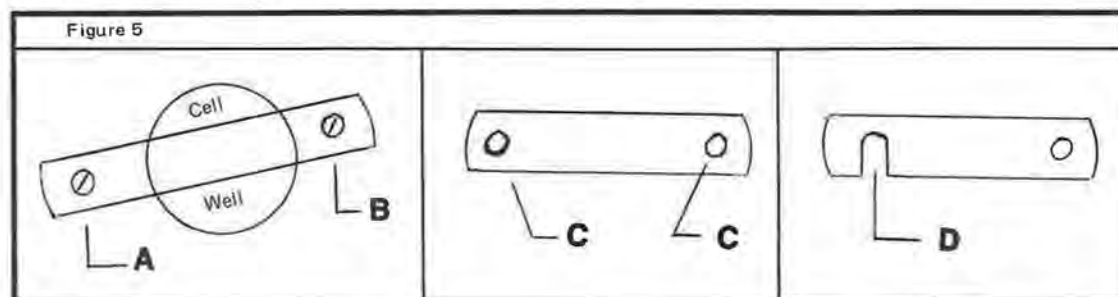
We have used shears to cut our battery clamp, then finish with files, and then drilled a small hole just a little larger than the screw threads. However, if the screw needs to be insulated, it will be necessary to drill an oversize hole to allow space for inserting an insulator.

Making the battery clamp only takes a short time and it is very important to do a neat job and use the proper thickness of stock. Too thick will take up too much space between the cell and the case back. Too thin a piece will bend too easily and thereby will not hold enough tension on the cell. A constant good contact is absolutely necessary. After polishing our finished product we can do like the better watch companies do and gold electroplate our clamp to prevent tarnishing.

BATTERY CLAMP SCREWS

Sometimes screws are lost and/or the wrong size is found due to sloppy workmanship before we receive the watch for repair. We even find cheaper watches with factory installed screws that tend to strip out just by looking at them cross-eyed.

Two types of screws are used: (1) regular metal machine type screws like those found in all of our "tick-tock" watches, and (2) tapered self-tapping screws. Metal screws are generally used for metal and the self-tapping type are generally used when the screw will extend into the plastic part of the module.



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Assortments of both types are available and it is nice to have a good selection of each type in our stock. At this point in time there are not too many sizes used, so we will probably be able to find one to fit from our assortment. This is not to suggest that ordering the proper factory screw is not necessary, but as in battery clamps, sometimes they are just not available for our watch. Also, for those very few time that WE might drop and lose a screw, it is less embarrassing if we have one handy from our "good ole assortment".

Also, we should take the extra five minutes and adjust the screw to fit by shortening it, or maybe cutting the head size down to match the other screws. Then guess what, no one will even know that one was lost and we can sleep better knowing what a super job we did. Good luck in fitting these screws and in making that special battery clamp.

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Our Readers Write

My 11-year old son fixes watches and clocks and would like to join as an apprentice, as he wants to have his name on a membership certificate. That way when people come in and he starts to work on their watches and might say something nasty to him, he can point to the certificate and say he follows the AWI code. Nelson's idol in watch and clock work is Mr. Fried. When I run into a problem repairing a watch or clock, Nelson says, "That's simple—just think how Mr. Fried would do it!"

Theo. Busch
El Paso, TX

We would like to join your organization. Your magazine *Horological Times* is an excellent informative publication—nice work!

Patty Tennesen
Madison, WI

I want you to know that I appreciate the *Horological Times*, keep up the good work. Thank you!

Henry Fuhrer
San Diego, CA

TIMES

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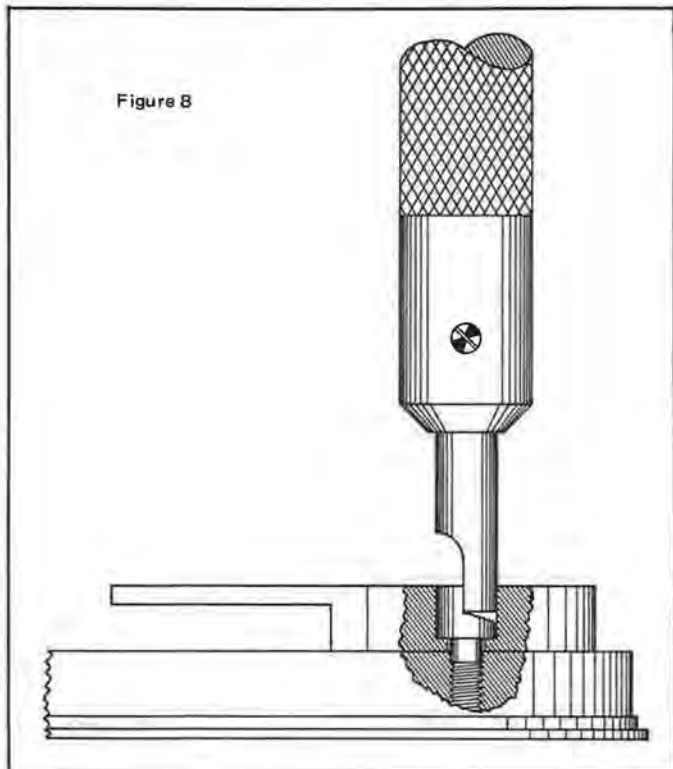
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TIMES

TECHNICALLY WATCHES

(Continued from page 15)

Figure 8



chuck holding device on top of a saw table for sawing the slot.

Another screw removing problem sometimes encountered by the watchmaker is shown in Figure 8. One-half of the screw head is broken away which makes it impossible to remove the screw with a regular screwdriver. In this case, a special screwdriver blade can be made for removing the screw. The special screwdriver blade is made from a piece of tempered steel rod. Enough material is ground from one side of the rod at its end to form a "D" shaped end. The "D" shaped end should fit the space very closely where one-half of the screw head broke away. The rounded part of the special screwdriver blade should be smooth and polished to avoid damaging the counterbored screw head hole in the cock or bridge as the screw is being removed.

"Antique Watch Restoration"
will continue next month.

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Calvin Sustachek



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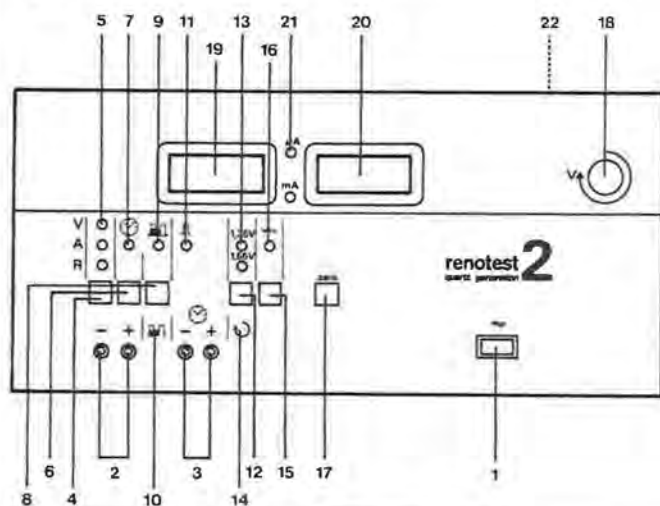
The Renotest 2 is a test instrument designed to allow extensive testing of quartz watches. It has incorporated into it a power supply output that has fixed voltages of 1.35V and 1.50V and an adjustable voltage to 5 volts DC. It is designed to measure battery voltage with or without load, current consumption of entire watch or separate sections, and resistance of motor coils whether connected or isolated from the electronic assembly. It has two LCD displays so that two measurements can be observed at the same time. It has indicator lights to enable the user to identify the pulse output from the electronic module.

The unit is supplied with three pair of leads that are fitted with probes, alligator clips, spring clips, and a battery cup to make it easy to reach into and connect onto

the watch terminals.

Figure 1 is a drawing of the front panel of the tester. The numbers identify the individual terminals, indicator lights and switches.

Figure 1



- 1 Switch-on key
- 2 Measurement cable plug
- 3 Movement power supply plug
- 4 Measurement selector
- 5 Measurement indicators
Voltage V, current A, resistance R
- 6 Movement type selector
- 7 Selection indicator, analog movement
- 8 Measurement function selector,
analog movement
- 9 Selection indicator, consumption
measurements (total mean current,
consumption of electronic circuitry)
- 10 Consumption and power supply measure-
ments (mean motor current, power supply
voltage)
- 11 Motor pulse indicator
- 12 Power supply function selector
- 13 Selection indicators, power supply
(fixed voltages)
- 14 Power supply, variable voltage
- 15 Selector for on-load check of batteries
- 16 Selection indicator, on-load battery check
- 17 Zero reset
- 18 Potentiometer for adjusting the
supply voltage
- 19 A display
- 20 B display
- 21 Sensitivity indicators (scale)
- 22 Vibrograf® plug

BATTERY TESTING

Battery testing can be performed in three conditions: with no load, with a fixed load, or with a variable load. The purpose of load is to simulate a condition under which the battery will be operating when it is the power supply for the watch.

To test a battery, the probes are connected into the two left input terminals. The battery cup can be substituted for the red probe to allow easier handling of the battery.

A. No load (Figure 2A)

1. Depress measurement selector (4) until the pilot light (5) alongside V is on
2. Place cell in cell test cup (positive down)
3. Apply negative probe to negative terminal of cell.

The voltage displayed on left display (19) should show the voltage of the cell.

B. Fixed load testing 1000 Ω resistance

1. Connections should remain the same as (A)
2. Press "load selector button" (15)

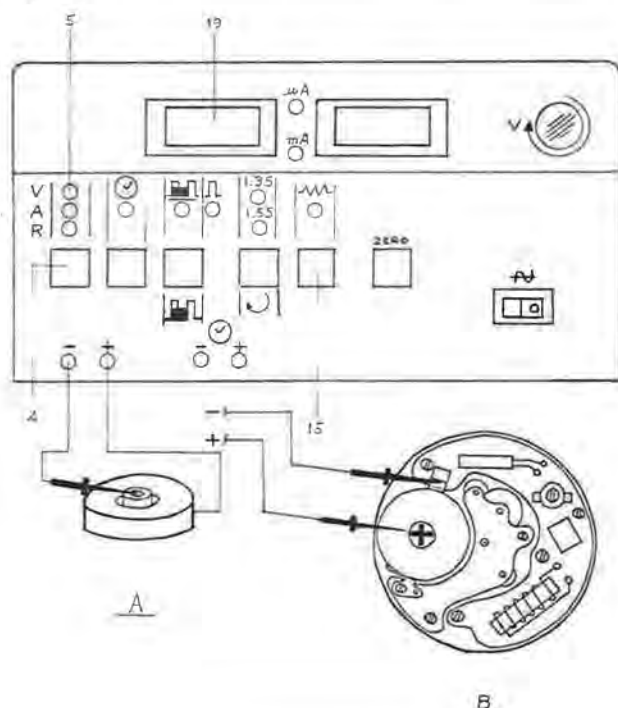
If the battery is good, the measurement displayed on the "left display" should remain at or above the voltage rating of the cell. RE: more than 1.35 for a mercury cell, 1.55 for a silver oxide cell.

- C. Batteries can be tested in the watch the same as above, applying the probes to the movement as shown in Figure 2B. When testing batteries, only apply the probes for a short period of time to avoid draining the power.

CURRENT CONSUMPTION

The Renotest 2 is designed to permit measurement of total current consumption, electronic circuit current, and mean motor current. Power can be supplied to the movement at a fixed 1.35V, fixed 1.55V, or variable voltage (Figure 3).

Figure 2



A. Current consumption at full battery voltage

1. Connect the red (+) and black (−) leads to the meter at (3) movement power supply.
2. Depress key 12 to get a fixed 1.55V (1.55V indicator light above it will glow)
3. Depress key 4 until A (Ampere) indicator is illuminated
4. Depress key 6 to select analog testing.

The indicator light above it should glow. With all other indicators **not illuminated** the measurement shown on the right display is the voltage, and the measurement on the left is the mean motor current.

5. Depress the key #8 so that the indicator above it lights up and the electronic circuitry current is displayed on the right, and the mean total current on the left display.

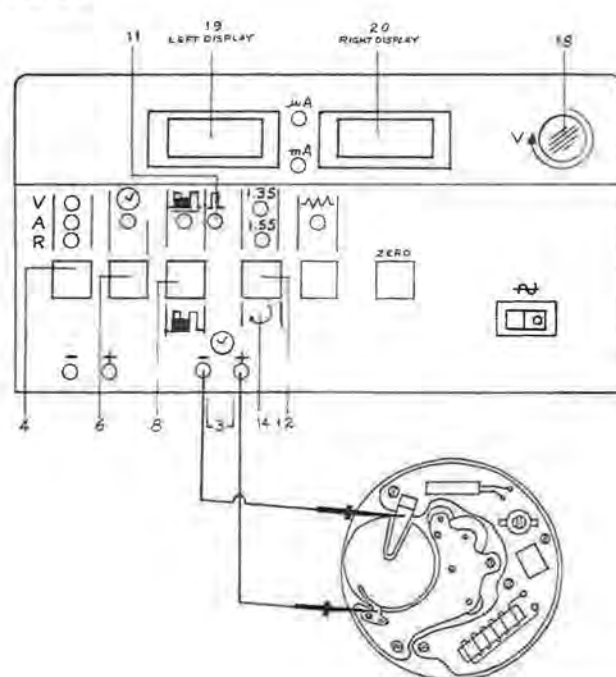
- B. Current consumption with variable voltage can be measured by depressing the #12 button so that **both indicator lights are out**. This then allows adjusting the voltage with the potentiometer knob #18.

- C. Motor pulse indicator lamp (11) should flash each time the motor receives an impulse. This is an indication that the electronic circuit and motor coil are functioning. Keep in mind that not all watches have a seconds pulse. Watches without second hands can have a pulse every 5, 10, 30 or 60 seconds. It is easy to assume that something is wrong with a watch when the pulse occurs at such long intervals. Consult the service manual of the individual model to get this information.

PULSE TESTING

Pulse testing is done to determine if there is an output from the electronic assembly. This is normally measured at the terminals of the electronic assembly where the motor coil is connected.

Figure 3



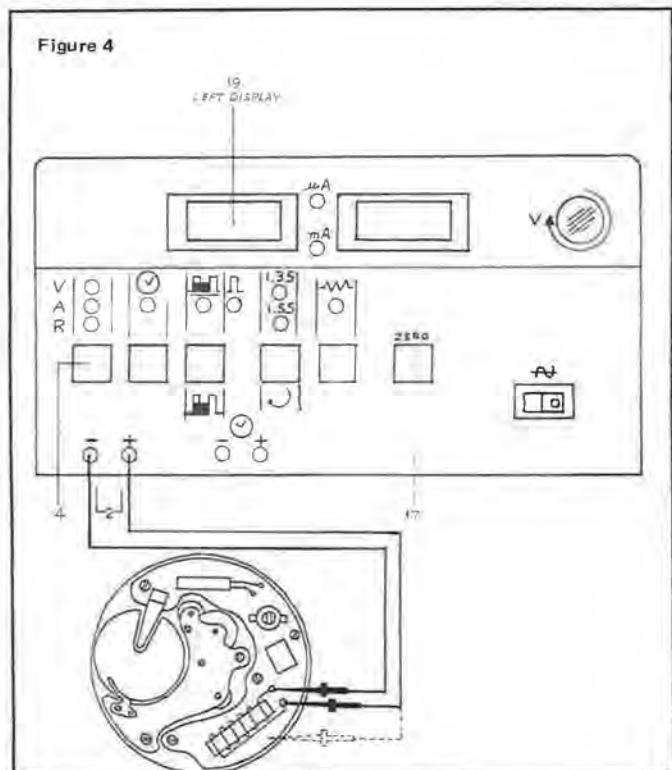
With the Renotest 2 this signal is displayed at the same time that current consumption measurements are being made. The indication of the motor pulse is shown by the amber lamp (11) in Figure 3 as explained in section C of the current consumption checks.

LOW VOLTAGE RUN

The low voltage run of a watch is a test to evaluate the condition of the mechanical portion of the watch. It is similar to winding a mechanical watch a couple of turns and observing the motion of the balance wheel. By reducing the voltage supplied to the watch and observing the forward motion of the train, the freedom of the train can be determined. Each movement has a specific low voltage at which this can be observed. This is normally found in the service manual of that particular model. In addition to this, many of the watch and watch equipment manufacturers supply lists of standard voltages, low voltages, and resistance values for each model.

Low voltage testing can be accomplished with the Renotest 2 at the same time the testing is done to measure current consumption and pulse testing. The voltage can be varied and reduced with the variable voltage power supply setting at #14, Figure 3 using the potentiometer adjustment #18.

When testing for train freedom the voltage is adjusted first to the normal running value of the movement; then it is lowered until the train stops advancing. If this voltage is higher than the specified low voltage value, it should be assumed that there is a restriction or binding in the train. This can be due to a number of causes; namely, dirt in the train, lack of oil on the pivots, or burrs in the pivot holes. These are strictly mechanical problems a capable watchmaker would be familiar with.



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1986 Member Survey

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2. List topics for which you would like *Horological Times* to publish articles. Be as specific as you can.

3. Would you be interested in writing one or more articles for *Horological Times*? You would receive a modest honorarium.

- ☐ YES (please give your name below) ☐ NO

If so, on what subject(s)?

Name (print)

4. Please check your current career status (check all that apply):

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Would you prefer to take these courses (check one):

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☐ At home using an instruction kit?

6. Could you teach one of the above courses, or another course?

- ☐ YES (please give your name below) ☐ NO

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Comments:

MISCELLANEOUS

8. Are you interested in home videotapes on horologically related subjects?

- ☐ YES ☐ NO

9. Should AWI search for new areas of skills that might interest AWI members to broaden the base of membership?

- ☐ YES ☐ NO

10. If yes for #9, in what areas would you suggest?

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TIME



Improvising In Jewelry Repair

Jewelry repair is the same as any other repair service. A lot depends on making quick repairs in order to do justice to our customers. To give quick service, materials and tools to work with need to be immediately available. It would be ideal if we had an unlimited inventory of gold stock, silver stock, heads, bezels, shanks, and other findings that we might need for any repair job that comes into our shop. Stones are also a necessity when doing jewelry repair.

To have an inventory that could cover every job that came into our shop would not only be impossible but financially impractical. The next best thing is to stock the basic materials and the fast moving findings and stones and use our ingenuity to convert the basic materials into whatever size and shape we need to make an immediate repair.

Probably the most valuable material supply is old gold and silver. It can be used for sawing out pieces or melted down into ingots that can be flattened by using a rolling mill or even by pounding (hammering) on a steel anvil with a steel hammer to the desired thickness. The rolling mill is one of the most valuable tools in a jewelry shop. Old gold wedding bands, ring shanks or any old gold can be rolled out to a desired thickness. If under .8mm thick it can be cut with jewelers shears even to very narrow strips that can be used for replacing prongs or wider strips suitable for making bezels. Some old gold that I roll out to 1½mm thick are sawed out in strips to make new shanks or half shanks for rings.

Old gold can also be melted down into nuggets for customers to make necklaces, earrings or bracelets. It is true that to make quick repairs one can change a head or replace a shank or bezel from manufactured findings which will no doubt save time if you have these replacement parts in stock. But if the parts have to be ordered, much time can be lost in ordering and packaging up the repair to store it while waiting

for the order to come in. The cost of ordering plus the cost of the findings and transportation can usually be much more costly than using a little ingenuity and making the finding from the old gold and finishing the repair at once. I am sure that the savings from not ordering will more than compensate for the time that was used to improvise. Although it is not practical to make heads or settings from scratch, most that come in for repair can be repaired by retipping, repringing, or repairing sides or weak places. This can also be done at a fraction of the cost of findings which will compensate for the extra time involved in using the basic materials.

Using specific pieces of karat gold jewelry, I will start with a 14K yellow gold engagement ring that had four side stones and the shank and stone settings showed very little wear except damage from the removal of the stones. As this ring is no doubt an assembled ring from die struck findings, the parts will be soldered together which means they can be disassembled by heating until the solder is at the flow temperature and then the pieces separated. The pieces you will have are shank, head, and four melee settings. Usually melee settings with two used on each side will be made together but can be sawed to make single settings. Most diamond settings are white metal so the shank will be yellow gold and the settings white gold. Where a head needs replacing if a new replacement head is not available, the used head from the dismantled mounting can be used and the diamond set followed, if necessary, by retipping the prongs or beads with the stone in place. This can be shaped and finished to look the same as the new head and will be as durable as the new head if not more so.

The side melee settings can also be used for replacement, but unless a side setting is in extra bad condition, I prefer to rebuild the old setting by gold soldering prongs and

tips or adding metal wherever needed to make an attractive and durable repair. The shank can be used as a replacement shank if not worn or it can be rolled out to .8mm thickness. It can then be used to cut out a bezel, corner or side prongs, or cut into strips with jewelers shears to whatever width needed for prongs or any repair needing thin metal. For thicker than .8mm a jewelers shear may not cut it accurately so sawing is recommended, and if you are proficient with the jewelers saw you can make it any width desired.

One important thing to remember when using the rolling mill or hammering jewelry metal to thickness is to anneal it every time it starts to show signs of getting hard enough to be brittle. Usually in the rolling mill reducing the metal one to three-tenths of a millimeter will make the metal hard enough to require annealing. Annealing is done by heating the metal to a cherry red and either quenching in ambient (room temperature) water or letting it slow cool on the asbestos pad, which will render the metal to a dead soft condition.

Men's karat gold rings are much heavier and contain much more karat gold. Some of these rings are die struck while others are castings. With either it is easy to see if any of the parts are attached with hard solder. First coat with flux, then heat it to a cherry red which will cause the solder to melt making it easy to see any solder joints that can allow the pieces to be removed by heating. Usually the shanks are not attached to the base of the ring whether it is made for a stone or a solid top. The shank can be removed by sawing or using side cutting pliers or shears. The shanks (if heavy enough) can be saved for reshanking or can be used for ring sizing stock. Having already been annealed when checking for solder joints, the rest of the ring can be rolled out flat on the rolling mill. To obtain uniform thickness it will have to be rolled to the thinnest place in the gold. This may require annealing more than one time, as rolling it thinner makes it harder and more brittle. If it is allowed to get porous it is useless as repair material. Often when this is rolled out it will be a very irregular shape, but it can be shaped by sawing off the excess that protrudes to form a square or rectangular piece of gold to work from.

The pieces that were trimmed should be saved because small irregular pieces of gold can often be utilized in repairing or rebuilding karat gold pieces of jewelry. A good example of this is repairing loop ends of ladies' watch cases where a metal band has worn the loop almost or completely through. A small irregular piece of gold can be shaped to fill the worn place and gold soldered in place. It is easy to use a bur in the flex-shaft tool and trim the inside of the loop, then file the sides and outside making it look like new. The inside can be left thicker than the loop originally was making the repair stronger and more durable than the loops were when the case was new. Small irregular shaped pieces have many uses

and, if saved, can be used instead of having to cut pieces from ring sizing stock or other larger pieces that can be used to an advantage on repairs requiring larger pieces of metal.

In repairing gold filled watch cases that have developed a hole, I have found it very difficult to fill the hole with hard solder. But by taking a piece of scrap that tapers down to a point and pushing it into the hole point first until the hole is filled, it is then simple to flux, place a small chip of hard solder against the piece where it joins the case, apply heat, and flow the solder in, around and through to the other side of the case. This can then be dressed off on the outside with a file and the inside with a small bur in the flex-shaft tool. It can then be polished so that it is hardly noticeable.

In repairing rings that have breaks where the box or bezel is pierced, a small piece of scrap gold can be inserted in the pierced hole next to the break and solder flowed around it. This closes the break and puts enough extra metal around it to reinforce and insure no reoccurrence of the break. This can be filed and polished and is hardly noticeable except for the pierced hole which will be closed or partly closed.

Karat gold watch cases are often turned in for old gold and they make an excellent source of repair gold for many repair uses. Watch cases will vary in thickness but the flat parts of them, when cut out, can be rolled the same as any other gold to reduce the thickness. Many karat gold cases have very thin flat parts which are suitable to cut out strips for stone bezels or very narrow strips for ring prongs. Some of the ladies' and gents' karat gold cases are very thin, so in all probability they have been stamped from very thin gold. Even this very thin gold, when cut into strips, can be useful in making repairs. Karat gold earrings are often found in old gold that has been sold for salvage. These are also a good source for repair gold. Pierced posts can be saved and reused as pierced posts or for gold wire to use as prongs or shaped as jump rings. Ear wires can also be used in the same way for similar repairs. Rarely do we find karat gold ear backs that are not for pierced ears, but when they are found they can supply small gold bars, balls, and even karat gold jump rings.

Karat gold chain discarded for salvage is valuable to a jewelry repair person. With a large selection of salvage chain most chain lengthening requests can be honored as well as repairs where just certain sections of a chain show wear. Short pieces of chain come in handy for making safety chains for necklaces and bracelets. Usually these can be installed completely from salvage materials which will give you a full profit on the repair.

One way to improvise that can pay excellent dividends in saving time and money is melting a small piece of gold for a ring enlargement. Most ring sizing stock is 1½mm thick or less. So when a ring comes to the shop for enlarging

(Please turn to page 35)



OPTICAL PROPERTIES OF GEMSTONES

Optical properties of gems are those properties which affect light as it is reflected from them or during its transmission through them. The optical properties of a gemstone are brilliancy, color, dispersion, luster, pleochroism, phenomena, refractive index, and transparency. With the exception of phenomena and pleochroism, these properties are often called constant optical properties.

In considering color, there are allochromatic stones and idiochromatic stones. Most stones are allochromatic, which means that the color is produced by minute traces of impurities. Such stones may occur in any one of a variety of colors. Beryl is a good example, the varieties of which include green (emerald), blue (aquamarine) and pink (morganite). Idiochromatic gemstones are stones in which the color is an inherent property. Since the color in such gemstones is a fundamental characteristic of the chemical composition, all specimens of such gemstones will have essentially the same color. Good examples are malachite and azurite. Color is the least reliable guide in distinguishing between the various species of gemstones.

Because of the importance of color in buying, selling and appraising, it is necessary for the jeweler to become conscious of even the most minute color nuances. The color of a gemstone involves four factors: 1) hue, 2) tone, 3) intensity, and 4) evenness of color. The **HUE** (red, green, etc.) greatly affects its value and beauty. A knowledge of not only the more or less valuable basic hues of each stone but of minute variations is essential. **TONE**: Any given gemstone has an optimum depth of color. If the gem is lighter or darker than the most desirable tone, it is less valuable. **INTENSITY**: The most valuable intensity in most gems is that which is most vivid. It is possible for some gemstones to have the correct depth of color (tone) and the correct hue, but yet appear dull. **EVENNESS OF COLOR**: This is very important in all gemstones except phenomenal gems and those in which inclusions add to their beauty.

BRILLIANCY

This property is of the utmost importance in judging value. A poorly proportioned and poorly polished stone will be less brilliant than a well-proportioned stone. This is particularly true if the pavilion is cut too shallow or too deep. While the

difference between the brilliancy of diamond and colorless sapphire is immediately apparent, differences between well-proportioned and poorly proportioned stones of the same species require more experience to judge.

DISPERSION

Dispersion is the ability of a gemstone to break up white light into its component parts. It is determined by how well the proportions of a particular gemstone have brought out the amount of "fire" that is to be expected from that gemstone. Poor proportions and poor polish reduce the amount of "fire" or dispersion. "Spread" diamonds or diamonds with large tables definitely lose a large amount of dispersion.

LUSTER

Luster refers to the appearance of the polished surface of a gem. It is the appearance of the surface when reflected light meets the eye. Also, the body appearance or reflected light below the surface should be considered as it may modify the surface luster with the result called sheen. The luster of a gemstone is the result of the refractive index and the smoothness of the polished surface. Most gemstones can be polished to a very smooth surface, some cannot because of their structure. The best example of such a gem is jade.

There are many kinds of luster: 1) Metallic, as displayed by the gemstones marcasite and pyrite, is the most brilliant. 2) Adamantine, as displayed by the diamond, zircon and demantoid garnet, reflects about 30% of all light falling on its surface. 3) Greasy or Resinous, as displayed by rough garnet and rough peridot, but both of which when polished display vitreous luster. Jadeite and nephrite display greasy luster on polished surfaces. Amber will display a resinous luster on a fractured surface, but almost a vitreous luster on a polished surface. 4) Waxy, resembles greasy and resinous luster but more irregular. The best examples are a poorly polished turquoise and almost all rough chalcedony. 5) Dull, absence of luster, seen on rough chalcedony. It is never seen on well-polished surfaces. 6) Silky, seen on rough specimens of tiger's eye. 7) Pearly, rarely seen in gems except rough pieces of moonstone and spodumene. The best example is the surface of fine pearls.

PLEOCHROISM

This is a term used to describe those transparent colored stones which exhibit more than one color. Dichroic refers to a stone which exhibits two colors. Trichroic refers to a stone which exhibits three colors. Stones of the tetragonal and hexagonal systems are dichroic, while stones of the orthorhombic, monoclinic and triclinic systems are trichroic. In no case will stones of the tetragonal or hexagonal systems show more than two colors, but stones of the orthorhombic, monoclinic and triclinic systems may show a total of two or three colors. The best means of observing these colors is through use of a dichroscope.

PHENOMENA

This refers to unusual characteristics of a gemstone. These include chatoyancy, asterism, iridescence, play of color, labradorescence, adularescence, adventurescence, and orient.

CHATOYANCY

This term is used to describe the streak or band of light reflected by a gemstone cut en cabachon. The gems displaying this effect are chrysoberyl, quartz, tourmaline, beryl, sapphire, ruby and feldspar. This effect is caused by reflection of light from minute parallel needle-like inclusions.

ASTERISM

Asterism is a term used to refer to the star effect. The specific star effect differs between various gemstones, but generally the bands of light making up the star are caused by reflections from minute parallel needle-like inclusions. Gemstones which may display asterism are ruby, sapphire, topaz, emerald, spinel, almandite, rose quartz, and chrysoberyl.

IRIDESCENCE

This is a display of prismatic colors, produced by very narrow fissures enclosing thin films of air or liquid. It can be seen in any gemstone.

PLAY OF COLOR

This describes colored reflections as seen in opals. It should not be confused with "fire" which is another name for the effect of dispersion.

LABRADERESCENCE

This is seen only in labradorite. In some stones large patches of a vivid solid hue often appear, which change gradually as the stone is moved.

ADULARESCENCE

Adularescence can be seen in feldspar which exhibits a blue to white sheen in certain directions. When the stone is cut en cabachon, a floating light is noticed as the stone is turned.

ADVENTURESCENCE

This is seen in sunstone and aventurine. It is a name applied to reflections that are either bright or strongly colored in a translucent material.

ORIENT

This refers to the surface sheen as seen on a fine pearl. It is a play of color on a very minute scale. It is distinct from dispersion and play of color.

CHANGE OF LIGHT

... or alexandrite effect, is caused by the selective absorption and selective transmission of light. It can be seen in some specimens of chrysoberyl, sapphire, synthetic sapphire, spinel, synthetic spinel, and tourmaline.

GIRASOL EFFECTS

Some specimens of opal, corundum, chrysoberyl, and quartz will exhibit a movable or billowy light effect as the stone is turned. If this happens, then the adjective girasol is applied to the specimens.

REFRACTIVE INDEX

What is meant by refractive index? It is the ratio of the speed of light in air to its speed in a gemstone. Light travels through air at 186,282 miles per second, or 299,792 KM per second. Upon entering a gem, it is slowed down. When it reenters the air, it resumes its former speed. Refractive index also indicates the relative ability of a gem to deflect light entering it. Light entering a gem is deflected, some to a greater degree than others. Diamond deflects light to a greater degree than most gems and has a very high refractive index of 2.41. Fluorite does not deflect light very much and has a low refractive index of 1.43. By accurately determining the refractive index, a most valuable indication as to the identity of the gem is secured. Double refraction is an important property. It is a valuable aid in helping distinguish imitations from genuine stones except those of the cubic system.

TRANSPARENCY

The transparency of a gemstone depends on the amount and nature of the light which passes through. The quality of light which passes through the gem depends upon the inclusions and the internal structure. If it was possible for light to pass through a gem without any distortion or absorption, the gem would be perfectly transparent. This, we know, is impossible. If light passes through a gem with no appreciable distortion, yet is absorbed by the gem, we could say that the gem is only partially transparent. The amount of absorption varies in gemstones. Diamond and colorless quartz are very transparent, while black chalcedony is very opaque.

There are five categories or degrees of transparency:

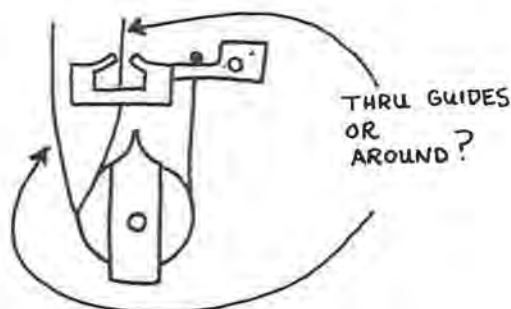
- 1) Transparent—light passes with no appreciable degree of distortion or absorption, i.e. diamond, colorless quartz, ruby, and emerald.
- 2) Semi-transparent—gems which cause a small amount of distortion or absorption, i.e. amber and the finest specimens of jade.
- 3) Translucent—gems that cause greater absorption or distortion, i.e. moonstone.
- 4) Semi-translucent—gems that allow very little light to pass through, i.e. amazonite and obsidian.
- 5) Opaque—gems that allow no light through, i.e. black chalcedony, lapis lazuli, and malachite.



TWO READERS SENT IN QUESTIONS CONCERNING TWO INTERESTING CLOCK MOVEMENTS. TWO OF OUR TECHNICAL EDITORS, DAVID ARNOLD AND STEVEN CONOVER, OFFER THE FOLLOWING ADVICE.

Editor

I have some questions about a Gustave Becker Grande Sonnerie Vienna regulator: (1) What is the proper cable matl. and its diameter that is currently available? 2) Should the cable go through the guides or around them?



I have tried 1/32 diameter braided brass cable both with different problems occurring. The weights are approximately 5½ lbs.

Bill Curley, Jr.
Waterbury, CT

As you know, this movement has a minimal amount of power available to operate and the more supple the cables, the less that power loss in flexing around the pulleys and drums. I use an aramid fibre cable available from Winfred M. Berg, Inc. in East Rockaway, NY. They supply a 1/32" braided cable, stock #AA-034B, in 25, 50, and 100 foot lengths. This cable has a tensile strength of 200 pounds, 50% higher than stainless steel, yet it is perfectly soft and supple to work freely with—no danger of kinking. It comes in a red color, which I hide by coloring with a black, permanent-type marker. You do not mention what problems you have been having, but I have had very good results using this material.

The "guides," as you call them, are simply stabilizing brackets for the pulleys during transit of the clock, without the weights attached, and serve to keep the cable taut and on the pulleys. As such, the cable should go around the "guides," NOT through them.

David Arnold, CMC, CMBHI

I have read Steven Conover's article "The Herschede Tubular Bell Movement" in the August 1980 issue of *Horological Times* and find that I need help and advice in addition to the caveats he mentions.

One of my customers has a 9-tube Herschede which is four years old. The clock stops at 10 minutes after 10 and sometimes 10 minutes after 11, always in the morning. If the pendulum is pushed to start the clock, it will not continue running. To keep the clock running, it is necessary to move the minute hand.

Please tell me what to look for and what to do in order to get the clock back into G.R.O. or better.

John MacSkimming
Lawrenceville, NJ

Here are a few points you can check in an effort to find out what is stopping the Herschede clock. Ask the customer not to restart the clock the next time it stops. You can then make some close observations. The times of 10:10 and 11:10 AM are rather odd, but they do tell us something.

A Herschede which stops at about the same times every day may have a moon dial problem. The dial operates each 12 hours. A Herschede service bulletin mentions that the moon dial moves between 9 and 12 o'clock. Check to see whether your moon dial actually changes at this time. If it does, investigate the moon dial further. Remove the dial, and push the moon shift lever assembly from side to side to see if it binds; adjust as needed. Reinstall the dial, then turn the hour hand through two or three revolutions to see if the moon dial works. If it does work, then look up from the bottom of the dial just to make sure the moon shift lever assembly is not pressing tightly on the moon eccentric disc.

After you have eliminated the moon dial as the source of the problem, check further in other areas. Your description indicates that you have a complete loss of power, released only when the hands are moved. When the clock has stopped in this manner, look in the glass side panel before you touch the hands. Check the chime warning pin. Is it jammed on the warning lever? Is the pin at the warning arm as it should be (at 10 minutes past the hour)? If you discover a problem in this area, remove the dial and check the chime gathering pallet. Replace it if it is loose. Also try placing it on in each of the other three possible positions in an attempt to achieve the correct warning pin position. When the gear train is locked (not at warning or chiming) the chime warning pin should be at a 3 o'clock orientation.

If you are still unable to locate a problem, inspect the hour, minute, and intermediate wheels for damaged teeth. Then look at the intermediate wheel pin which raises the lifting lever at the first quarter. If the pin is loose or damaged, replace the intermediate wheel with a new one.

Steven Conover, CMC

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Watch Must Be Sterile

Most horologists are deeply concerned as to the proper method and procedure by which a watch should be cleaned. It is proper that they should. However, there are other elements which enter into this operation which are often overlooked—in fact, seldom given any serious thought.

Your watch must be more than clean—it must be sterile as well as perfectly dry.

It is needless to ponder over the various methods concerning the different ways used in cleaning watches, as I will assume that you are familiar with this part of the work. We are, however, concerned as to the performance of the watch after our work is completed. Of course, the rate at which the watch will perform will depend upon various conditions. Assuming that the watch is in order, it will only rate as a timekeeper in proportion to the tolerance calibrations made in the watch in the process of manufacture.

One of the most important functions in the completed assembly is the steady flow of power which is contained within the mainspring barrel, while the spring is wound. Herein lies the point of having a sterile cleaning.

The parts of the watch which come in contact with the oil, if not sterile, will in a short time contain no oil, as the oil like a great many other elements will follow the line of least resistance.

You can very easily prove this

point by taking a clean and sterile piece of glass and place thereon a small globule of watch oil, and you will note that it will remain in the form of a globule for a long time. Now just wipe this oil off the glass with a cloth but do not make the glass entirely free from the small amount of oil which might remain, and repeat placing a small globule of fresh oil on the glass, and you will note that it will run in all directions.

This is the action which takes place on the bearings of a watch which is not clean. You as well as I have in the past oiled watch bearings and within a short time your customer would be in your office and complain that his watch did not rate as closely as it had done a few months prior. Upon examination with the microscope through the cap stones, it would quickly be revealed that the bearing was dry and you would wonder as to whether the oil had departed. However, due consideration in the oiling of the end stone must be made and the proper amount of oil must be placed thereon. If the end stones are given too much oil, the capillary pull will be away from the pivot and the oil will be drawn upward and around the jewel settings.

In regard to what is good watch oil, I shall not mention any specific kind. There are very few kinds or brands that deserve to be used on such a fine instrument as a watch. One thing is certain—it must be of organic origin because oils from other sources do not contain elements which provide an unchanged viscosity under extreme temperature changes and also in all of the mineral oils the

evaporation is too rapid. Make a few tests for yourself and you will soon discover that the breaking down of the small oil balls which make up the oil mass will progress at a much more rapid pace in mineral oil than in porpoise oil.

For the last year I have been experimenting on the effects of coloidal graphite on the watch main spring but up to this time I am not prepared to state my findings. I can, however, assure you that fish oil and graphite will not do.

It is of importance that you use a clean oil cup. Make it sterile also before you fill it with fresh oil as any accumulation of dust and debris will only be transferred to the oil cups in the watch. If the oil is not clean and you look through the cap stone under the microscope, you will cover your face in shame and say to yourself, "It's a rotten job!"

In applying oil to watch parts, I have four different oilers, but the one which I use most is just a small steel quill pen and to do it I have affixed a handle about four inches long, using a small brass nut to hold the pen rigid on the handle, which also serves to keep the pen from touching the top of the bench and thereby foul the oil.

Be assured that while the oiling may seem to some as a rather unimportant item, get right on this subject. Follow a few simple rules. It will pay you handsome dividends by receiving fewer complaints. Don't forget—even if you use a good brand of oil, you can still have trouble if your jewels are not sterile and the oil improperly applied.

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PICKLE BARREL

(Continued from page 27)

that has a thicker shank it could mean laying it back and ordering a piece of ring sizing stock thick enough to do the job. You would probably have to purchase an inch long piece and the cost of your investment would no doubt be much more than you could charge for the ring enlargement. Find a piece in the old gold salvage that will melt into a larger piece than is needed but of the same karat and color of the shank you are to enlarge. Lay it on the asbestos pad, flux it, and heat it until it melts and forms a dome shaped piece something near half round. With a rolling mill it can quickly be rolled to the thickness desired. Without a rolling mill it can be flattened by hammering it on a steel bench block with a steel hammer. This can then be held in the rough jaw parallel pliers and a piece sawed out to the size and shape of the piece needed to put in the ring shank to make it the proper size. It can be installed the same as any other piece being put in a ring for enlargement.

When using old gold for repairs small and irregular bits and pieces are left over. These can all be saved and, if the karats and colors are kept separate, remelted back into useable ingots or sent to a refiner and sold or refined and put back into useable material. In jewelry school while I was taking a ten-week course, my family gave me a box of old gold. When it was melted down and put into ingots it yielded

about four ounces of 12K gold. This was my practice gold while taking the course and after getting into my own shop it was my repair gold for many months. In my own shop old gold would accumulate from remount jobs and size down ring work, so from that time until today the old gold accumulated has been sufficient for my supply of repair gold. Every so often after the gold has been melted more than once, it is put with the filings, bench sweeps, and dust from the polishing motor and sent to a refiner. I always request that it be returned in plates that are 1½mm thick, .8mm wire and gold solders. This also keeps me in solder so the jewelry crafting and repair is mostly supplied with material from old gold. In making some pieces of jewelry, findings have to be ordered such as ring shanks, heads, settings or safety catches.

It is true that the handling of old gold is time consuming, but if you take time to check on the costs or repair gold you will find that for the time spent you are well compensated in the money saved. The prices you charge for the work should be based on what the materials would cost if ordered at current prices.

In the next article we will discuss some of the unusual repairs that people bring to a jewelry repair shop.

TIMES

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Book Review

GRANDFATHER CLOCKS AND THEIR CASES, by Brian Loomes, 352 pages, 9x11½", hard covers and dust jacket, 451 b/w illustrations. Pub. 1985 by Arco Publishers at \$49.95.

Brian Loomes is the author of some standard reference books on British clocks and is an excellent researcher as well as a dealer in antique clocks. The term "Grandfather clocks" originating in the United States in 1880's (Work's song, "My Grandfather Clock") appears to have been adopted by English writers who formerly referred to these as Long Case, Tall Case, Floor or Hall Clocks.

This book also displays the author's acknowledged expertise in describing and analyzing each part of these elegant timepieces. With over 450 photos and very high class drawings, he covers in fine detail their origin, casework, type, period of manufacture, quality of each, and methods of identification by geographical origin.

In his early chapters, Loomes covers the distinct two main types—the thirty hour and those with the extra train wheels to run the clock eight days. The differences between movements of these categories are beautifully illustrated with fine drawings and photographs all supplied by the author. Train layout illustrations are thus almost self-explanatory. The author even details characteristic train wheel collets. Plate versus posted frames are also shown.

Escapements are correctly drawn in detail as are various striking mechanisms, some in isometric. Casework likewise is shown and explained in many photographs and line drawings. Dials, too, are treated in the same definitive detail. Some photos are large, clearly showing the excellence in chasing of the dials, their engraving, scrollwork, and matting. Spandrels often supply important clues to a clock's age and origin and these are also included.

The periods covered are from the earliest Fromanteel of the seventeenth century to about 1870. Provincial makers receive about as much attention and coverage as those of famous urban makers. Northern clockmakers with their large dials often used Dutch style scalloped minute (track) bands to balance the large white dials they used.

Painted (white) dial clocks, although the subject of an earlier Loomes book, are also included here with a chapter itself which covers these clocks in the period 1770-1870. The chapter on Scottish tall clocks show some typical examples. Those in the nineteenth century exhibiting characteristics of Northern England with painted dials and heavily proportioned ornamental, and at times, top heavy hoods.

Irish clocks are shown and described in detail and in text. Special, complicated, and unusual clocks are covered in a special chapter. Moon work, astronomical, musical, and unusual mechanisms are covered as well.

The chapter "Fakes" should be important reading to even the experienced clock person. A detailed index is a great help in locating certain items.

While there are many good books on grandfather clocks, this new one should stand high among the others.

Henry B. Fried

CLOCKS—A Guide to Identification and Prices, by Tran Du Ly, 250 pages, 8½x11", soft covers. Published 1984 by Arlington Book Co. Price \$15.00.

This identification and price guide is a compilation of the various companies' catalogs, 32 companies being represented. Mainly American, it combines these products in alphabetical order with both their original descriptions and prices as well as the author's estimates of each clock pictured.

The hundreds of black and white illustrations aid in identifying the clocks from such popular makers as Seth Thomas, Ansonia, and Howard. Others less known and for which it is otherwise difficult to find illustrative material are here illustrated. Makers such as Bulle, Riefler, Eureka, Hatch, Parker and Whipple, Standard Electric Time, Magnets and others are included.

This reference also contains some instructional pages and hints on electric clocks. A good Cammarata-compiled index makes it simple to locate a clock and its informational details. Aside from the prices and pictures, many contain editorial footnotes on the clocks, their domes and availability, cases and repairs.

The Bulle electrics as well as the Riefler astronomical clocks make good references. Also one learns that the large French lyre pendulum clock with pinwheel escapements bring hundreds of dollars more than their dead-beat escapemented counterparts. These all incidentally were made in Morez, France—despite the names of Waterbury, Welch, etc. Also, that you can buy a nice new car for the price of an old Riefler astronomical clock.

Henry B. Fried

THE MODERN CLOCK by Ward L. Goodrich, facsimile reprint with paperback of the original 1905 edition, 5x8", 502 pages, 160+ pictures, reprint by Arlington Book Co., Box 327, Arlington, VA 22210.

Although first published over 80 years ago, Goodrich's book has found favor in every generation since, going into repeated reprints. Its popularity stems from its choice of subject matter which at that time contained information sorely needed. The fact that following horological generations haven't changed is evident in this book periodically running out of print.

It is noted for its chapters on cuckoo clocks which it covers comprehensively, including the cuckoo and cuckoo quail with excellent drawings and instructions, inclusion of chapters on the pendulum which are definitive, gravity escapements, striking systems, and an expanded section on the products of the (then) contemporary Self-Winding Clock Company showing all the electrical and mechanical details of this timekeeper. The chapter on the cylinder escapement, using the excellent woodcut illustrations and text taken from the German original articles, also enhances its appeal.

Henry B. Fried

AMERICAN POCKET WATCHES-ILLINOIS WATCH CO. *Encyclopedia and Price Guide, Volume 2*, by William Meggers and Roy Ehrhardt. Soft cover, 8x11", 418 pages, fully illustrated, 120 pages of watches and factory adv. Published 1985 by Roy Ehrhardt, Kansas City, MO 64134. Price \$50.00.

This second encyclopedic volume on American watches covers the full products of the (Springfield) Illinois Watch Company. As such it is the most definitive work on the many different movements produced by this versatile factory.

The authors are foremost in researching and publishing books on American watches which contain history, photographs, identification, and (current) price guides. Ehrhardt was one of the first of the many to publish an "identification and price guide" and thus this new volume reflects many years of collective experience with his co-author, William Meggers. Mr. Meggers—with an engineering background—has published much on the products of the Illinois Watch Company.

When one examines this 8x11 inch volume with its more than 400 pages, countless illustrations—all about just one watch company—it is reasonable to expect that virtually every detail about the Illinois company would be included, and it is. Reading through the many pages and examining the illustrations and photographs, one takes note of separate sections dealing specifically with mechanical features, patents, nameless numbered grades, lettered grades, private label advertisements and names, production tables and dates, cases, production listings of jewels, setting systems, factory illustrations, how-to sections, and how to identify your watches . . . to list all would require about another hundred items, each listed in the indexed table of contents. The list of private label names used on Illinois watches runs well over 700 alphabetically listed names, many include the detailed variations and models used with each named watch. This amounts to more than 1500 detailed models using private names of jewelers.

Oversize photographs of many watch movements, line cuts of factory advertisements, give the reader an idea of original sales prices. Views of the factories producing that brand and the personalities famous in the history of the Illinois Watch Company are shown, many whose names also appear on some of that company's models.

The 93-page list of serialized production date tables also list the dates and some also give a very close date and month. For example, let us show one such listing:

*18 size, (no.) 57,901 to 58,000. Lever set,
Hunting, 7 jewels, model 3, completed
March 1880.*

The Bunn are fully covered in a family tree chart. The price guide listing is of current values. This book also reveals that the last Illinois watch (marketed by the Hamilton Watch Company) numbered 5,698,801, 21/0 size, and is dated at 1948. Another is the estimate placed on the current value of an Illinois 26 jewel Bunn Special at \$6,000-\$7,000.

This book, ten years in the making, sells for \$50—but for anyone with a collection of such watches, sacrificing one of the lesser watches acquires this MUST volume, recommended for its excellence of format and research.

Henry B. Fried

This identification and price guide is a compilation of that company's catalogs, those that serve the widest selection of that maker's products.

This compilation has treated the movements in the illustrated clocks with equal importance. There are over 100 pages of these movements illustrated with descriptions. The format includes reference of each clock and the movement it uses. It is also cross-referenced to indicate in which illustrated clocks these movements are housed.

This issue contains four main sections: History, Domestic Clocks, such as alarms, banjo, calendar, carriage, chime, city, crystal regulators, electric and hall clocks, wall clocks, mantel and musical clocks, novelty and ship's bell clocks. A third section deals with bracket, street and tower clocks. A fourth section is all about movements. Catalogs used in this compilation date from 1863 to 1968. This volume is fully indexed and a complete list of available books on clock and watches completes this 260 page volume.

Henry B. Fried

THE CLOCKS OF SHENANDOAH, by Philip Whitney, 93 pages, 11x8½", soft cover, Commercial Press, Stephens City, VA 22655. Price \$10.95.

This soft-bound book deals with the history and design characteristics of tall case clocks manufactured in the Shenandoah Valley of Virginia. Since these clocks were not the only ones made in Virginia, the author has described in detail the characteristics which make them so distinguishable to this particular locale.

Mr. Whitney states that he has spent more than ten years in the research which led him to produce this book.

First, there is a brief overview and a map of the area in Virginia showing the towns in which the clocks were made. This could be very helpful in determining where the clock-makers settled.

Mr. Whitney gives a general description of the movements he has encountered as to the materials used and unusual characteristics, but there is a lack of technical back-up and clear photos or drawings of the movements.

A section of the book is devoted to the history of these Virginia clocks as to their establishment. A biography describes their personal history as well as the peculiarities in their designs.

An unusual and very helpful feature of this book is a listing of the cabinetmakers and clockmakers and the towns in which they performed their work, as well as the dates.

The majority of the book is filled with photos, detail drawings of the cases, and brief descriptions. The quality of the photos and the paper selected does not do justice to the clocks. Needless to say, the details are enough to help the historian in his identification.

This book would be a helpful addition to the library of those who are interested in the identification of these clocks. Several collectors have commented that the book proved to be very helpful in establishing the identity of these Valley clocks. Anyone interested in these clocks should consider acquiring a copy, now available from book distributors, for his reference library.

Robert G. Draucker

SETH THOMAS, CLOCKS & MOVEMENTS—A Guide to Identification and Prices, by Tran Du Ly, 260 pages, 8½x11", soft covers. Published 1984 by Arlington Book Co. \$19.95.



Milton C. Stevens

Executive Committee Meeting Recap

The Executive Committee of the American Watchmakers Institute met the weekend of January 31-February 2 in Kansas City, Missouri. As is customary, whenever the Committee meets in an area other than Cincinnati, Ohio, a workshop or seminar program is held utilizing the Executive Committee personnel was presented. More than 100 members attended the Sunday program which featured the following presentations.

In the morning session, Henry B. Fried discussed the various methods used in retrofitting quartz watch movements to customers' valued watch cases. He discussed the kinds of materials which can be used to make "plugs" of the new quartz movement and other materials which can be used to fill in the voids in cases after the quartz movement has been installed.

Fried also went into detail on the various methods used to install dials on retrofitted movements. He discussed the use of tiny bonding pads and double-faced tape to secure the dial to an inexpensive retrofit job. In the case of a more valuable piece, Fried demonstrated how a special electric soldering device can be used to solder new dial feet in proper position. Mr. Fried showed various units that are available commercially for this work; he also gave a schematic of how one can build their own device.

As Mr. Fried pointed out, the various watch companies have been engaged in a form of retrofitting for years. They frequently design various case filling devices in order to fit existing movements into cases which have already been produced with a dif-

ferent shaped or sized opening. It is only now that the watch repairer is beginning to do the same thing on a smaller scale in his own shop.

During the afternoon program, Robert Bishop discussed Common Sense Quartz Watch Repairing and Marvin E. Whitney presented his program on the Ship's Chronometer.

Mr. Bishop discussed equipment required to make quartz watch repairing profitable. He went into detail on the proper ways to use this equipment to diagnose and correct faults in quartz analog watches. Shortcuts in testing and isolating malfunctions were also discussed. Drawing on his years of experience as an in-warranty service agent for a leading watch firm, Bishop pointed out a number of the causes for high current consumption. Of special interest was Robert Bishop's discussion of casing and crystal techniques employed to service all brands of watches today. He also discussed particular calibres and the various makes which have exhibited some common faults.



Henry B. Fried



Robert Bishop

He went on to describe the best ways of isolating and correcting these service problems.

Following Mr. Bishop's discussion, he fielded questions about specific problems watchmakers were having with the calibres of watches coming into their shops at this time.

The final program of the day was a presentation by Marvin E. Whitney. Mr. Whitney used slides as he discussed the history and technical aspects of marine chronometers. Drawing on his experience as a former chronometer technician at the U.S. Naval Observatory, Mr. Whitney presented one of the most



Marvin E. Whitney

complete programs ever to be assembled on the subject. Many of the photos and charts used in Mr. Whitney's presentation were ones he used in his recently published book *The Ship's Chronometer*, which is available from AWI Press at \$75 per copy. This outstanding book contains 500 profusely illustrated pages on the history and technology of chronometers. A few autographed numbered copies remain available at the time of writing this article.

While in Kansas City, the Executive Committee was treated to a tour of the Ernest Borel Material House facility in downtown Kansas City. Borel was one of the first material houses to convert their operation to a computerized system. The Committee members saw first-hand how this modern technology speeds the order filling process from the time an order is received on the firm's 800 number recording device until it is filled and shipped to the customer. Mr. and Mrs. Marc Borel were dinner hosts at their home on the outskirts of Kansas City. The AWI personnel were grateful for this fine display of hospitality. The evening before, the AWI personnel had the opportunity to host a small reception for about 20 members of the local AWI affiliate chapter in Kansas City.

TUES

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Number _____



...from all around the ASSOCIATION...

CALIFORNIA

The Horological Association of California closed out 1985 with their Installation Gala Ball. The 90 people in attendance enjoyed good food, entertainment, and a fascinating speech by the vice-president of western operations for Bulova Watch Company, Jerry Josephson.

Plaques were bestowed to Norman Levine, outgoing president who served for two years, and Warren Rogers who served as president for the five years prior.

The association meets in a very famous veterans building in Los Angeles (est. 1925). While Mark Karno was vice-president in 1985 he coordinated the restoration of an original clock in Patriotic Hall. The dial, movement, and wood case were completely restored to original by three members. The restored clock was presented to the building manager, Bob Luttrell, with a plaque that read: "This clock has been



Left to right: John Butler, R.T. Smith, Algona Smith, George Sprang, Alice Sprang, Mark Karno, Warren Rogers, Norman Levine, Jerry Vilicich, Ginger Purdum, and Dennis Lesser.



Pictured with clock, left to right, Mark Karno and Bob Luttrell.



Left to right: Mark Karno receives gavel from outgoing president Norman Levine.

restored and rededicated on December 7, 1985 by the Horological Association of California, in honor of all the veterans who served the United States to preserve democracy and freedom for all".

The association's new officers for 1986 are: Mark Karno, president; John Butler, first vice-president; George Sprang, second vice-president; Algona Smith, secretary; and Jerry Vilicich, treasurer.

CONVENTIONS

Missouri Jewelers & Watchmakers Association
80th Annual Convention
April 18, 19 & 20, 1986
The Lodge of the Four Seasons
Lake Ozark, MO

Texas State Watchmakers Convention
May 2, 3 & 4, 1986
Ambassador Hotel, Dallas, TX

Horological Association of Virginia Convention
May 2, 3 & 4, 1986
Roanoke, VA

Kansas Jewelers Association
80th Annual Convention
May 30, 31, and June 1, 1986
The Holidome, Hutchinson, KS

Watchmakers Association of Pennsylvania
Annual Convention
June 6, 7, 8 & 9, 1986

NEW YORK

At the January meeting of the Horological Society of New York, Inc., Jean Fischer, clock expert extraordinaire, gave a chalk-talk on "The Carriage Clock". He introduced his chalk-talk with a brief history of the development of the carriage clock which he traced back to the 16th century. At that time it had a very different shape but gradually evolved into its present form.

At the completion of the history, Mr. Fischer discussed construction and servicing. He pointed out that there were two types of carriage clocks: Petite Sonnerie and Grand Sonnerie. The Petite Sonnerie chimed on the hour and on each quarter hour. The Grand Sonnerie did more. It repeated the hour chime and each quarter-hour strike. With the use of chalk drawings, Mr. Fischer depicted the levers and gears that activate each system and described the methods used in adjusting and servicing them. As a further visual aid Mr. Fischer circulated a carriage clock which he had received for servicing.

ILLINOIS

The Central Illinois Watchmakers Association presented an AWI slide program on "Production Repairs" by Wes Door at their first meeting for the new year in Bloomington, IL.

A question and answer session was held following the program.

The new officers for 1986 are Larry Hustedt, president; Sue Hinrichsen, vice-president; Duane Laramée, treasurer; and Mary Ann Bilyeu, secretary. Board members are Bill Eaton, Jeannie Laramée, Chuck Ramsey, Scott Robbins, and Steve Spinner.

VIRGINIA

The Horological Association of Virginia, Inc. recently held their Board Meeting at the Holiday Inn South, Charlottesville, Virginia, with President Steve Black presiding. Invocation was offered by Chick Hardy of the Roanoke Valley Guild.

Directors and alternates in attendance were: Wayne C. Simpson, Central Virginia Guild; Rodney Graves, Peninsula Guild; Francis Gallagher, Ann Salamini and Skee Jenssen, Potomac Guild; Chick Hardy, Chubby Wiggins and Melvin Drawbond, Roanoke Valley Guild; Lawrence Edwards and Charlie Soukup, Tri-City Guild; Forrest Waggy, Northern Virginia Guild; and Robert N. Liskey, Shenandoah Valley Guild.

TIME

We're interested in your color slides.

The American Watchmakers Institute knows that there is a wealth of talent in its membership and that this talent is not only in the field of horology. There is seldom a gathering of a group of watchmakers and clockmakers where a camera is not also there.

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TIME

New Products and Literature

NEW LORUS HALLEY'S COMET AND LOVE WATCHES

Love and Halley's Comet are two of the many watch designs in the latest Wrister line from Lorus Products. There are 21 new Wrister styles, all of them different. Wrister combines the bright colors of fashion plastic watches with innovative watch-hand movements, new for a fashion look.

Lorus is introducing its latest Wrister designs just in time for Spring gift giving. The Love watch features heart-shaped watch hands and the word L-O-V-E on the watch face. The ladies' "Love" watch is available with white, black, red or yellow plastic straps, and the men's style features a black plastic strap.

The Halley's Comet watch

is the perfect way to tell someone that they are a star. The watch face features a comet second hand, the comet's tail as the minute hand, and the moon as the hour hand. With a black plastic strap and the choice of either a black or white watch face, "Halley's Comet" is truly a unique time-keeping accessory. It combines 1986's most memorable event with 1986's fashion look.

Priced at \$24.95-\$29.95, these colorful, fashionable watches are all water resistant, operating with precision quartz accuracy. All models have two or three year battery life (approximate).

For more information contact: **Lorus Products, West 80 Century Road, Paramus, NJ 07653, (201) 265-9200.**



Lorus introduces the Halley's Comet and Love watches, both from the latest Wrister line of watches.

BULOVA ISSUES 1986 CLOCK CATALOG

The 1986 Clock Catalog from Bulova Watch Company illustrates a full range of clock styles from compact travel alarms to decorator wall clocks. Bulova is featuring more clocks in a wider choice of shapes, sizes, textures and functions than ever before, according to Anthony Rodriguez, vice-president and general manager of the company's Clock Division. "This catalog not only demonstrates Bulova's commitment to the growth of its Clock Division, but it also reinforces our pledge to increase clock awareness among the trade," he said. "It is aimed at helping retail stores increase their share of the growing market for clocks."

The 50-page, full-color Bulova Clock Catalog, which illustrates more than 165 different models, can be obtained through your Bulova sales representative, or by contacting: **Bulova Watch Company, Inc., Bulova Park, Flushing, NY 11370, (212) 565-4200.**



Bulova's 1986 Clock Catalog

WEDDING RINGS FROM KEEPSAKE

"Vitality", part of the new complementary diamond wedding ring collection from Keepsake, has pave-set diamonds. The

bride's ring is traditional, yet features fashionable styling and has a total weight of 10 points. The groom's ring has bold texturing and borders of polished gold creating a substantial look and feel, with a total of .15 points. Keepsake is a leading manufacturer of diamond engagement, wedding and anniversary rings. The company also produces a line of pendants, necklaces, bracelets and men's diamond rings. For more information about the company and product line contact **Keepsake, 450 W. 33rd Street, New York, NY 10001, (212) 244-4990.**



"Vitality" Rings from Keepsake

KINGSWOOD MANUFACTURING'S JEWELRY CLEANER

A major plant fire 30 years ago forced a successful distributor of costume jewelry to look for a new way to make a living. In the wake of the destruction of his plant on Third Avenue in Columbus, Ohio, James E. Mullin began marketing a jewelry cleaner he had originally developed to clean rotating stock. From that one-man operation in 1956, Kingswood Manufacturing has grown to a major producer of jewelry cleaning products and equipment to stores and jewelers throughout the world.

Joe Mullin, Kingswood's current president and son of the founder, hasn't changed his

father's original formula. "We still sell the formula he developed, because it still works better than anything else on the market," Mullin said. "And we still make it ourselves in our plant, so we can vouch for its quality."

The original formula was designed for department store use, Mullin explained. It's a cleaner that works on any jewelry—costume jewelry, intricate jewelry, fine jewelry, jewelry with pearls, as well as pearl strands. It's also safe, quick, effective, and requires a minimum of physical effort. "It cleans chemically, but it cleans safely," Mullin said.

The all-purpose formula is also called "pearl-safe", because it contains no ammonia, Mullin explained. Ammonia can attack some pearls, he said. Knowledgeable jewelers will explain to people who own fine pearls or pearls of sentimental value that they should avoid ammonia formulas when cleaning pearls. "Why take a chance?" Mullin asked.

Jewelry cleaned with the all-purpose formula must be rinsed and dried before it is stored or worn, Mullin added.

In 1963 James Mullin developed a second jewelry cleaning formula designed especially for jewelers. "When jewelers clean a purchase for a customer," Mullin said, "they don't want to have to leave the customer to rinse the piece." Accordingly, the new formula contained ammonia and was marketed as a no-rinse cleaner. The ammonia not only provided the rinse-free property, but also improved the cleaner's ability to remove inorganic dirt and left an attractive shine. Jewelers readily accepted this convenient and effective cleaner for their non-pearl jewelry.

At the same time, Kingswood Manufacturing introduced a new service that has become the hallmark of its business, providing jewelry cleaner in jars printed with the jeweler's name and logo. "We like to tell the jewelers that

we're the cleaner that's good enough to have THEIR name on it," Mullin said.

The private labelling program offers two benefits to jewelers, according to Mullin. First, the jars remain in the home as long-term advertising—a nice feature in a field where the jewelry itself carries no indication where it was purchased. Second, jewelers find attractive Kingswood jars sell more readily, in part because of their own high reputation in the community.

The label can carry far more than just a logo, Mullin pointed out. "We often design logos with directions, labels in two languages (English, plus French, Spanish or German), labels with Canadian spellings of "jewellers" and "jewellery". We make sure the label is printed exactly the way the jeweler would do it if he were doing it himself," Mullin said.

For a free sample of Kingswood's original pearl-safe cleaner or the newer no-rinse cleaner, write **Joe Mullin, Kingswood Manufacturing, 1410 E. 17th St., Dept. H., Columbus, OH 43211** or call **800-848-3582**.



Kingswood's Pearl Cleaner

HOWARD MILLER ISSUES 1986 CATALOG

Howard Miller Clock Company has issued a 1986 catalog that illustrates in 104 color pages all of the clocks in the company's traditional and modern collections. The catalog depicts clocks in lifestyle settings as they are featured in the company's national consumer magazine advertisements. The extensive line is presented, for easy review,

in product categories—mantel, anniversary, alarm, wall, gallery, institutional, specialty and floor clocks—followed by useful reference material on movements.

Making the catalog more than a mere compendium of sales information are such features as the historical notes introducing each section, and pictorial recognition of such notables as Dr. Henry Kissinger, Bob Hope and Isaac Stern to whom the company's coveted Hourglass award has been presented for productive use of their time.

Models new this season, keyed for immediate identification, include a number of anniversary clocks, several alarms, the "Elegance and Brass" group of prepackaged wall clocks, seven

quartz wall clocks in bright, polished lacquer, and eight distinctive floor clocks in cherry, oak and mahogany.

Clock retailers may obtain a copy of the catalog by writing on professional letterhead to **Howard Miller Clock Company, 860 East Main St., Zeeland, MI 49464**. Cost to the consumer is \$5.00.



Howard Miller Clock Catalog

PULSAR'S ANALOG SLIM DRESS QUARTZ



Classic styling and contemporary burgundy colors are a winning combination in this men's and ladies' analog slim dress quartz pair (left to right): PHC006s and PED204s. Both models have oval gold tone cases that emphasize the burgundy Roman numerals against the champagne dial, with color coordinated burgundy cabochon crown and matching genuine leather strap. The men's model (PHC006s) retails at \$89.50 and ladies' (PED204s) at \$85.00. Both watches have a mineral crystal and approximate three-year battery life. For more information contact: **Pulsar Time, 1111 Macarthur Blvd., Mahwah, NJ 07430, (201) 529-2400**.

Classified Ads

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Dates To Remember

MARCH 1986

15-16—Michigan Jewelers Association Convention & Trade Show; Hyatt Regency Dearborn; Dearborn, Michigan. Theme: "GOLDRUSH". For more information contact MJA at 221 N. Pine Street, Lansing, MI 48933; phone (517) 372-5656.

15-16—Common Sense Quartz Watch Repair Bench Course (AWI); Robert F. Bishop, instructor; Houston, TX.

15-18—Georgia Jewelers Association's Annual Convention; Callaway Gardens; Pine Mountain, GA; (912) 743-8612.

18-23—AJDA/JIDA Co-meeting; Palm Springs Marquis Hotel; Palm Springs, CA.

APRIL 1986

4-6—Montana-Wyoming Jewelers Association Convention and Trade Show; Holiday Inn West; Billings, MT.

6-7—Management Seminar (AWI); Fred S. Burckhardt, instructor; Sarasota, FL.

11-13—Wisconsin Horological Society Convention; West Towner; Madison, WI; (608) 238-2385.

13—Retrofitting Bench Course (AWI); Buddy Carpenter, instructor; Findley, OH.

17-24—14th European Watch, Clock & Jewellery Fair; Basel, Switzerland; (212) 757-7030.

18-20—Missouri Jewelers & Watchmakers Association 80th Annual Convention; The Lodge of the Four Seasons, Lake Ozark, MO. Information Sharon Blair, Executive Director, P.O. Box 12553, Overland Park, KS 66212, (913) 381-2033.

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

26—Auction—Wristwatches, watches, clocks, jewelry; 2 PM, Auktionen Dr. H. Crott & K. Schmelzer; Casino Aachen, West Germany. Viewing: Apr. 19-25. Information Geschäftsstelle: Pontstrasse 21, Postfach 146, 5100 Aachen, West Germany.

27—Ontario Watchmakers Association Annual Members Meeting. Information: RR 1, Cookstown, Ontario, Canada L0L 1L0; phone (705) 458-9221.

27—ESA Analog Quartz Repair Bench Course (AWI); James Adams, instructor; Woodside, NY.

MAY 1986

2-4—Texas State Watchmakers Convention; Ambassador Hotel, Dallas, TX. For information write: Chairman, Texas Watchmakers Convention, P.O. Box 3983, Dallas, TX 75208.

2-4—Horological Association of Virginia Convention; Hotel Roanoke; Roanoke, VA. Information: Steve Black, 3119 Franklin Road, SW; Roanoke, VA 24014, (703) 344-4446.

30-1—Kansas Jewelers Association 80th Annual Convention; The Holidome; Hutchinson, KS.

JUNE 1986

6-9—Watchmakers Association of Pennsylvania Annual Convention. Information: Watchmakers Association of Pennsylvania, 1126 Centre Lane, State College, PA 16801.

AUGUST 1986

9-11—19th Heart-of-America Jewelry Show, Marriott Hotel Overland Park, I-435 & Metcalf, Overland Park, KS. Information: Sharon Blair, P.O. Box 12553, Overland Park, KS 66212, (913) 381-2033.

16-17—Wisconsin Jewelers Association Trade Show, Olympic Resort, Oconomowoc, WI; (608) 257-3541.

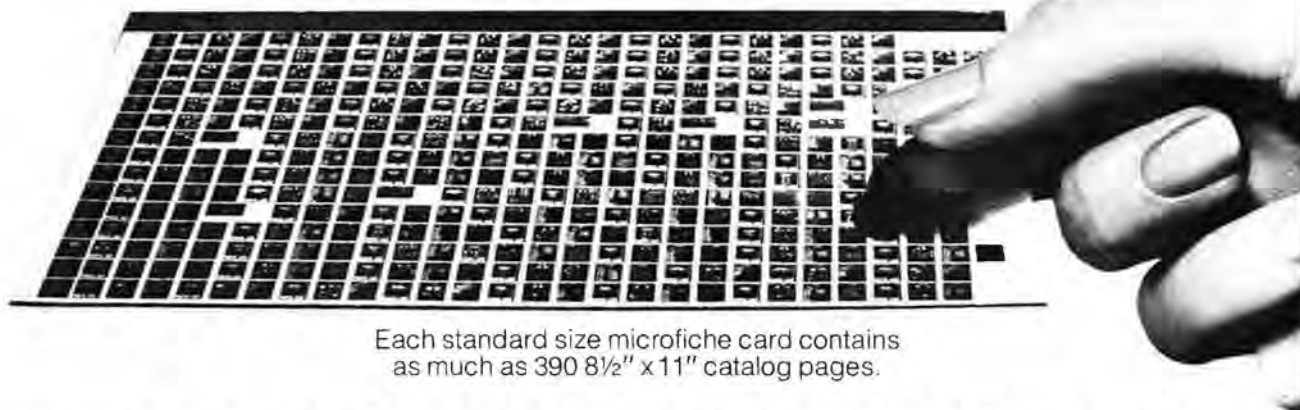
23-24—Minnesota Jewelers Association Fall Trade Show, Radisson South, Bloomington, MN.

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