HOROLOGICAL TIMES

May 1997



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ON THE COVER: This photo of monarch butterflies was taken in Cape May, NJ by Jack Goldstein of Cranford, NJ.

AWI
UP FRONT

President's Message

Well, it appears that spring is upon us. I know because I just spent the weekend at the beach and got my bald head sunburned. What else does spring mean to the watchmaker? It marks the start of another season of rusty watches to repair. Now I don't know about you, but we haven't been able to get rust remover from our supply houses because of the high cost of shipping "hazardous material." They just don't sell rust remover any more. We're experimenting with materials like Naval Jelly, but we have not found anything that suits us yet. If any of you have a solution, we will be happy to hear about it.

Spring is also the time that all those wonderful people who agreed to serve on the committees of AWI work so hard to get their ideas on paper and get ready to present them at the June meeting. You may not know it but these committees are the backbone of AWI. They are the ones who make everything work and it has worked well for the past thirty-seven years. So, all you chairmen, get busy and talk with your committee members to get their input for your report.

Also it's time to get busy collecting batteries for the ELM Trust. Resale of these batteries bring in cash making it possible for some who cannot afford formal instruction to get an education through a grant from the ELM Trust. There is also a lot of fun when each Affiliate Chapter competes for the honor of bringing in the most pounds of used batteries. So, get out there and collect those batteries and get them to AWI.

Now I'd like to make a request of all of you out there. Our watch material bank is always in need of watch movements. Sure, we have more than enough FF 60's and the like, but we desperately need American pocket watches and higher quality watches. If FF 60's and the like are all you have, then send them in because the ELM Trust can turn them over to Project Extend as practice movements for the students.

You know, it appears that I am always asking something of you so I am going to ask one thing more of you. I am going to ask you to ask yourself the question, "What

Continued on page 29.

Executive Director's Message

In last month's issue of *Horological Times*, we reported on the results of the readers' survey distributed in the January 1997 issue. I'd like to take this month's column to suggest a few opportunities to those members who are interested in making contributions of their own to the success of our magazine. Since there is a fifty-fifty split between those of you who want to keep the cover focused on nature scenes and those who would like something different, we will probably adopt a wider variety of cover themes in the coming year. For those of you who are not aware, the *Horological Times* cover is an open competition to those members who submit suitable photographs. We are looking for high-quality color slides shot in a vertical format. The proposed cover photo must be suitable for the issue of *Horological Times* in which it is to appear. Those members who submit cover art that is selected for an issue of the magazine will receive a 9" x 12" framed copy of the original photograph. All slides should be submitted to the attention of the editor of *Horological Times* at AWI Central. Selection of the winning covers is the sole responsibility of the editorial staff of *Horological Times*. All slides submitted will remain the property of AWI.

Many of you also suggested additional topics for articles that you would like to see published in the magazine. Well, we in turn are on the lookout for a few good writers who can contribute to *Horological Times*. If you have a topic or a series of articles in mind, why don't you try to put it on paper for submission to the magazine. All submissions must be typed and double spaced. Articles should be accompanied by clear black and white photographs pertinent to the subject matter. Black and white line drawings are also acceptable. First-time writers submitting articles should submit a short biography or resume. *Horological Times* will pay a one-time honorarium to authors for each article of up to $150, based on content and length. All published articles must be copyrighted under the *Horological Times* and remain the property of AWI. The editors of *Horological Times* reserve the right to approve and edit all manuscripts submitted for publication.

Continued on page 29.

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QUESTIONS & ANSWERS

From the Henry B. Fried Library

QUESTION

I have a 16-size Elgin. It has 23 jewels and a safety barrel. It has an up-down (reserve power) indicator, fully jeweled. It seems to have a part missing. Can you send details on this particular movement?

Charles Moore, Grants Pass, Oregon

ANSWER

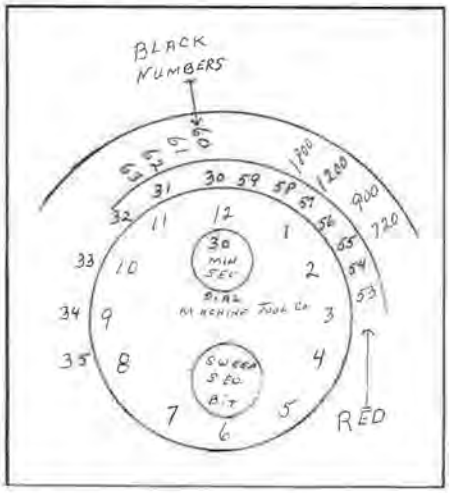
We are enclosing copies of pages 128-131 from Roy Erhardt's book, *Elgin Watch Company*. These pages provide spare parts information and schematic diagrams for both the 18-size and the 16-size Elgin watches with winding indicator.

Nancy Danner,
Librarian/Technical Services

QUESTION

Please advise us as to what type of timing this dial does for our customer's stop watch.

D. Hooper, Bowmanville, Ontario, Canada



ANSWER

Your request was passed to me for a reply. I recall seeing several stop watches of this general type in the 1930s and through the years of World War II. I feel quiet sure this one was used as an event counter. For instance, counting revolutions per minute (RPM) of machinery, hammer strokes per minute of a punch press or a forge die. Some had one-to-several scales around the main dial as you show. Some had scales that could be moved relative to each other via a knurled edge on the respective scale. A companion piece to this was a little hand-held instrument with a conical rubber tip that could be held in the shaft center hole of a shaft, motor, engine, etc. That device had a little worm reduction gear and dial that indicated revolutions into several thousands.

The watch and RPM counter (it really was only revolutions) and stop watch could give a pretty good count of revolutions per minute. The idea is to get a revolution count in a known period of time. Then the RPM could be calculated. The scales on your watch probably indicated revolutions per minute (or events) with a given period of measured time.

The factory millwright would hold the watch in one hand, the counter in the other. After a specific period of time the watch was stopped and the counter pulled from the device tested.

I'm at a loss to understand your watch scales. However, the numbers 1800, 1200, and 900 are the speeds that large synchronous motors rotate on 60 Hertz power. These numbers are for 4-, 6-, and 8-pole motors respectively. Two-pole motors rotate 3,600 RPM, and 12-pole motors rotate 600 RPM.

Many machine tools have stroke counters (events). For example, a punch press counting three strokes per second will be turning out 180 pieces per minute. A count and time period should be over a whole minute for a reasonable estimate of production per hour.

Mr. Hooper, I feel like your watch was used by a millwright (factory machinery maintenance man) for counting events and speeds.

J.M. Huckabee

QUESTION

The enclosed photo shows a cuckoo clock/music box movement made by E. Schmeckenbecher, Germany. This is a one-day clock. My problem is how does the movement trip the music? What part is missing?

K.C.K., Tomah, Washington



ANSWER

I have marked the trip wire for the music box on your photo. There are several ways to make a trip release. However, the most popular trip release comes from either the trip lever or the rack lever (of which your movement contains). The wire from the music box hooks into either of these levers. There are a couple diagrams in *The Black Forest Cuckoo Clock Book* by Karl Kochmann on plates 123 and 124. I am enclosing a copy of these pages for you to follow. Should you have further questions about this, please write or call me.

James Williams,
AWI Instructor, Cuckoo Clock Course

QUESTION

I have an 18 karat gold 3/0 pocket watch case that is very thin and has cracked enamel on it. I have been trying to remove the enamel. I have tried heating it and putting acid on it, but nothing seems to work. What would you advise?

W.K.A., Tampa, Florida

Continued on page 48.

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ASK HUCK

By J.M. Huckabee, CMC, FBHI, FAWI

Making Specialty Parts

Q. What is the future in operating a specialty parts business: making wheels, pinions, and other parts for clocks? Is this a good business to be in?

A. I would like to ask the same question. I just don't know. Currently I'm not acquainted with anyone who does that work.

I did this work through the entire 1960s as a sideline job, and averaged about twenty hours per week activity. My primary employment supported our household, but that gear work provided many luxuries to the family. It was also responsible for bringing my household affairs into excellent economic circumstances. It was responsible for supplying the vast array of tools I now own. It served me well. I now make a few items for members of my local trade guild, but in reality I'm retired.

The work arrived to my shop in three forms: (1) make a piece to fit that, (2) make a piece to replace this damaged sample, (3) make a piece to this detailed and dimensioned drawing. I liked the dimensioned drawing jobs best. My jobs came from clockmakers and industry. The good drawings usually came from industrial sources. Many industrial model parts were made of plastic, where the raw material was supplied. In most cases small amounts of raw material have a large amount of labor added. Beyond equipment cost, it was a sale of skill and time.

My start came through local trade guild associates, and a material supplier's assistance. I see a number of advertisements in a variety of trade journals for specialty work. These seem to increase each month, and some sources have been active for many years. I suspect this can be a good business.

Bushing Wear

Q. Why do bushings wear the way they do? What causes the wear to be in one direction? Why do they cause the clock to stop?

A. Let's discuss these items from the clock repairman's point of view. The wear is from friction and is augmented by whatever abrasive material that may be picked up by the lubricant. Imagine the oil and dust particles forming a grinding compound that cuts away at both pivots and pivot holes in the clock plates.

The pressure of the pivot upon the bearing surface (pivot hole) can be very great in terms of pounds per unit area. This is greatest near the mainspring of the typical clock movement. That force and rotation cuts away the pivot hole surface and the pivot surface. The result is one or both of two things. The pivot will have rings of wear on its surface, and the pivot hole wears away as it yields to the grinding action.

The pivot hole becomes elongated and with internal wear rings that mate with rings of wear on the pivot. The pivot now locks into the pivot hole, "ring-to-ring," which locks up the arbor endshake. Likewise, the pivot sideshake is lost as the pivot now has a new location of exactly pivot size.

The worn pivot now requires more power, because the wear becomes a "power robber." The movement may be cleaned and lubricated, but that does not remove the robbery of power. A further result of wear is that the associated wheel and pinion depthing is altered, which is another "power robber."

The "power robbers" are each quite small, but collectively they "eat up" all of the reserve power that was built into the clock. It now stops.

The good news is that this type of problem is easy to recognize and can be corrected. Refinishing the pivots and insertion of a new bearing (called a bushing) solves the problem nicely. If the pivot is too badly worn, a new pivot is inserted into the arbor.

This is a type of repair problem that cannot be solved by cleaning, or lubrication with a better oil.

If you have any questions, please write:
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ROCK QUARRY

By Fred S. Burckhardt

Someone asked me if I always told the truth when I write these columns. The answer is a definite sometimes. After all, what is truth? If you look it up in the dictionary, I will tell you that it is the opposite of non-truth or as some may say untruth.

Let's focus on this for a minute. If a customer comes into your place of business and asks if his/her watch or clock is ready yet, do you possibly tell a small opposite of truth? For example, "Parts are on order." If all the parts that are supposedly on order were all shipped, none of the supply houses would have any stock. What about, "Yours is next in line." You told her that three months ago. If she brings it up, are you going to tell another little white lie to cover up the first, or are you going to be honest and confess that you weren't telling the truth to begin with because you didn't want to lose her business because you needed the money to make the final payment on your Great Grandmother's funeral?

I can truthfully say that I have never knowingly lied to a customer. On second thought, maybe once or twice at the most, but no more than three times. There was that one time when a woman came to pick up her husband's watch and I told her the sapphire crystal on his Rolex was already cracked when he left it for repair. Fortunately she said it was probably true because he was a real klutz. But, what if she started to argue with you? I use the old war wound trick of grabbing my side and grimacing in pain saying, "Sorry, it's my old war wound acting up again. By the way, I'll put in a new crystal rather than lose you as a customer. I'll have to use the money I have saved up for my medicine but I can stand the pain for awhile." A small flag hanging on the side of the bench won't hurt. If things go right, she'll insist on paying for the crystal and wouldn't consider you going without your medicine. Of course, you have to be a veteran to make this work properly.

If it is against your religion to tell a small fib, the next best thing to do is faint. Better yet, grab your chest and ask the customer to hand you your heart pills in the small bottle in the corner of the bench. This will not only shut them up, but it will scare the H— out of them. They'll promise not to bother you again and to just call them whenever the job is ready.

Always try to sell a dial refinish job. That way, when the customer becomes irate, you can always blame it on the dial company. This brings some great anti-truths into play. For example, "I'll never use them again if their service doesn't improve," or "I know it's taking a long time but they do beautiful work. You'll be pleased when it comes back." Another is, "I could have made a whole watch by the time I get your dial back. I'm sorry they are taking so long with your dial. I don't like to keep a customer's watch this long but please understand, my hands are tied." All these can prove to be even more effective if you can show some tears while you're talking to the customer.

There are times when telling the truth has more impact than making up a story. For example, " I'm sorry but I don't have your job ready yet. I've just gotten behind and I'd rather not do the work unless I can take my time and do it right. I'd rather not take your money unless I know I've done the best possible work on your watch. If you want it back to take somewhere else, I'll be glad to return it to you." This does two things. First it confuses the customer. They expect an argument or some flimsy excuse. Instead you leave them with nothing to say. Second, it makes the customer feel sorry for you because you are working so hard trying to do a good job with their repair. You end up looking like a good guy.

I must close now and get this in the mail as it is already late. It would have been done sooner but the computer started to act up. The repairman promised he would be here but called to say his wife was taken ill and he had to rush her to the hospital for an emergency operation. And you thought horologists could come up with some good ones!!!

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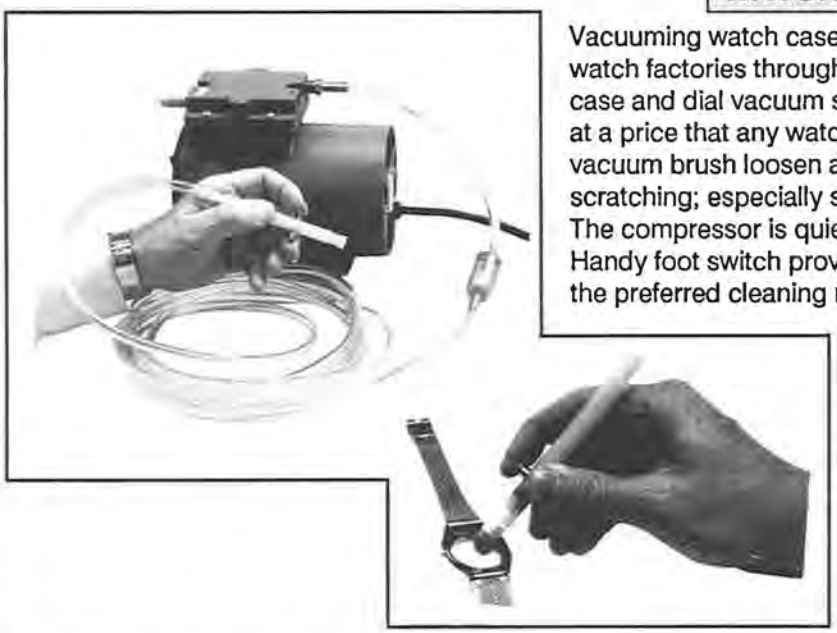
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Clock Movement Damage from a Broken Mainspring

Part 2

By J. M. Huckabee, CMC, FBHI, FAWI

When a clock movement breaks a mainspring it often wrecks the movement. The second part of this series deals with an old American clock that has a damaged arbor from the rapid expansion of a broken spring. Usually the American clock damage can be corrected. In clocks with hardened pivots, arbors, and pinions the pieces may be broken and new parts must be made.

Part 1 of this series showed the correction of a damaged wheel. This article assumes that the material of Part 1 will be combined with this teaching.

The Problem

The expanding spring caused the arbor bend illustrated in Figure 1. We have a badly bent arbor, and a slight bend in one pivot. Often there will be multiple bends in the arbor, pivot damage, and possibly damage to wheel teeth. A few small burs were found on the wheel teeth, indicated in Figure 2. This appeared to be from wear, rather than from the broken mainspring. Such can be cleaned up with a soft wire brush.

Where Do We Begin?

The place to begin is an important decision because the job can turn into "a dog chasing his tail" situation. First, straighten the arbor. That is done with little or no regard to wheel wobble or pivot wobble. The arbor may have multiple bends. Work on the big one first. Support the arbor near its ends (not on the pivots) and roll the piece. Your guide should be run out of the pinion. Usually the pinion shrouds are a suitable indication, but the real guide should be the pinion wires or leaves. Replacement of pinion wires will be the subject of Part 3 in this series.

Once the arbor is straight, straighten the pivots and then the wheel. Straightened pivots usually need to be refurbished, and possibly a bushing installed in the movement plate.

The Tools

The tools are few and simple. Figure 3 shows two identical bench blocks that I use. This may be a pair of hardwood blocks of similar size with the end grain up. The tools of Figure 4 are a flat-faced bronze punch, a piece of brass rod, and brass and steel hammers. The punch should be bronze or brass so that it does not leave scars on the arbor. This arbor is soft, and a hard steel punch will leave damage marks.

Light strokes with a small brass hammer brings the arbor to a nearly straight condition. Roll the arbor and keep the high point up during this work. Direct hammer strokes are shown in Figure 5.

Continue with the bronze punch and steel hammer as depicted in Figure 6. Clocks that have hard arbors and pivots must have the pieces annealed prior to straightening. American clock arbors, as illustrated, are usually mild steel and usually can be straightened without danger of breakage.

The action illustrated in Figure 6 brings the arbor to approximately straight. It is often necessary to over form the piece slightly in order for it to remain straight. That is a situation where the use of wooden blocks have a distinct advantage. The arbor can be driven into the wood to safely achieve the necessary over-form.

When the steel blocks are used, I slip a piece of paper or thin card stock under the arbor tip to permit over-forming. Illustrated in Figure 7, a postal card thickness or less is usually sufficient. When the arbor rolls and the pinion runs true, the pivots are checked next.

Place the pivots in a depthing tool, or between lathe centers, and inspect for pivot wobble. As the arbor is rotated, watch for run-out at the pivot arbor junction. The pivot is supported by its extreme tip in Figure 8 for that test.

The brass rod of Figure 4 has its end drilled to a close-fit size to the pivot. Now use that tool as a handle to straighten the pivot. That technique is shown in Figure 9. At this point it is the time to straighten the wheel. That teaching was illustrated in Part 1 of this series.

The arbor, wheel, and pivots are ready to go. Now is the time to consider the pivot bearings in the movement plates. Theses may need suitable bushings to match your refurbished pivots. Make a final test between centers, as in Figure 10, or between lathe centers. I use the lathe and touch the arbor with a little fine abrasive pad to make it look nice.

As a watchmaker, I was taught to make repairs, and clean and adjust the watch as my final step. Note that the pieces in Figures 11 and 12 have the work completed, ready to be cleaned and assembled.

Conclusion

Jobs of this type, related to the American clock, can be executed with very little possibility of the pieces breaking. Even so, the mild steel arbors can be reproduced on a small lathe and it is easy to drill the arbors and install an inserted pivot. The careful worker can turn out a result with little or no evidence that a repair has been made.

The techniques here can be practiced with complete confidence of excellent results. However, if the clock is a type with hardened steel pieces, they must be first annealed.

Forward

The third and final article in this series will show the technique of rebuilding a lantern pinion. That is not a job resulting from this spilled mainspring, but more commonly from wear.



Figure 1. A broken mainspring bent this second wheel arbor.

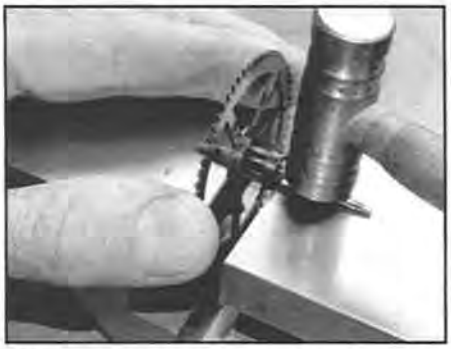


Figure 5. Use light strokes from the brass hammer. The bench block prevents over-forming.



Figure 9. Straighten the pivot. A pivot-sized hole in this brass rod does the job. Hard pivots must be annealed first.



Figure 2. A spilled mainspring may cause tooth damage. This second wheel shows a few tooth burs.

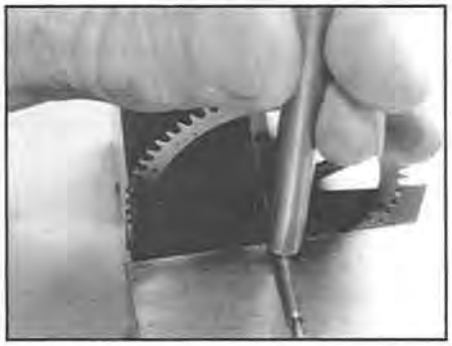


Figure 6. Use the flat-faced punch as your finishing tool. A hard arbor will break unless it is annealed first.



Figure 10. Check pivot in depthing tool or between lathe centers. The pivot may need to be refurbished.



Figure 3. Two equal-height bench blocks support the arbor, high position up.



Figure 7. An arbor may require slight over-forming to remain straight. A slip of paper or card stock can be used to obtain that result.

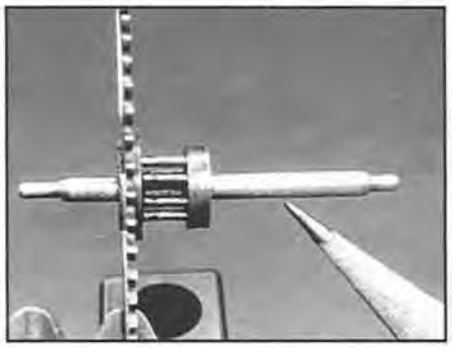


Figure 11. The finished job. Pieces from old American clocks are not hard and rarely break in the hands of a careful worker.

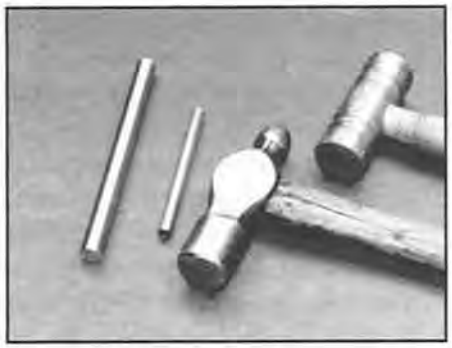


Figure 4. The tools are a brass and steel hammer. A flat-faced bronze punch and brass rod are work pieces.

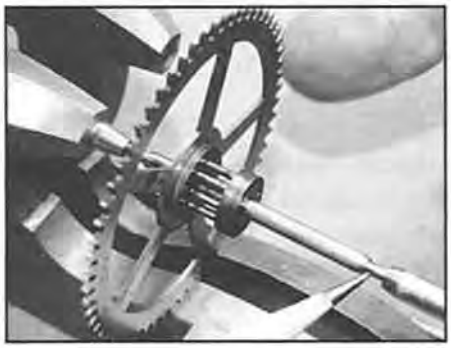


Figure 8. The pivot may also be bent. Check in a depthing tool or between lathe centers.

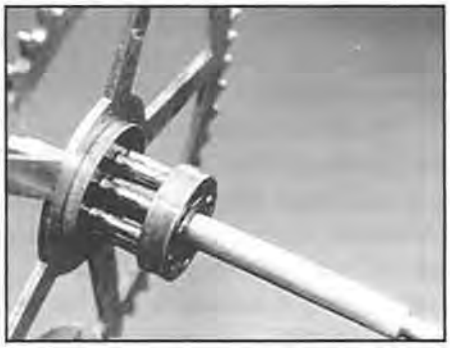


Figure 12. Ready to be cleaned and returned to service. This job may even escape detection of its prior damage.

PICKLE BARREL

ANSWERS TO MOST OFTEN ASKED QUESTIONS

PART 30

By Marshall F. Richmond, CMW

Many questions have been referred to me over the last seventeen years pertaining to jewelry crafting and repair and I have tried to answer all of them either by letter, phone call, or in future articles in the "Pickle Barrel." In this article, and the next if needed, I will try to give information that will answer these questions for the benefit of all the readers of these articles.

The general subjects will be fluxing, heat shielding, pickling, torches, soldering machines, pre-cleaning, finish cleaning, drilling, use of flex shaft tool and burs, prong and bead replacement, and where to obtain stones, gold, and silver.

Fluxes and fluxing seem to be what has created the most questions so I will list many of the fluxes available. First one must understand what fluxes do and why they are necessary for successful soldering. Flux puts a coating on the metal to be soldered or welded. Flux prevents oxidation of the metal resulting from the heat required to melt and flow the solder. Oxides prevent the flow of the solder. Although fluxes do have some cleaning ability, work to be soldered should be pre-cleaned before applying flux and heat. Names of some fluxes and comments follow.

Plain *borax* mixed with water can serve as a flux for gold or silver soldering nonferrous metals (metals not containing iron). Gold, silver, copper, nickel, and many others used in jewelry are nonferrous metals. A half-century ago while in watchmaking school and taking a ten-week course in jewelry repair we were issued a borax slate and used "20-Mule Team" household borax. Figure 1a is a borax slate. The borax slate has a bowl depression with lines which make it rough. A stick or cone borax can be rubbed on these lines which will leave a powder. When water is added, a liquid flux is made which can be applied with a borax brush. Such a brush is now called a flux brush.

Batterns is a prepared flux that has been widely used by manufacturing jewelers. It is available to individual craftsmen from most material supply houses. I use it almost exclusively on nonferrous metals. (See Figure 1f.)

Eurema was widely used for nonferrous metals, especially when using an electric soldering machine to supply the heat. Because it contained cyanide, I have been told, its use has been banned as too hazardous.

Schwerters is a flux with a good reputation and is used for nonferrous metals. It is available from most material supply houses.

Aircosil is a flux that will work for silver or gold soldering ferrous metals or nonferrous metals. Hard solder will flow by using this flux to solder steel to steel (even stainless steel), and also to gold, silver, nickel, copper, or brass. It can be used to solder ferrous metal to ferrous metal, or nonferrous metal to nonferrous metal. I have had many inquiries as to where Aircosil is available. I find the material houses where it once was available no longer have it. They do have a similar flux available which is Kwikfluxer (see Figures 1c and 1d).

Kwikfluxer is apparently a similar formula as Aircosil. I have tested it extensively and am now using it. Two of the material suppliers that I use are now carrying it in stock. If you cannot obtain it from your regular suppliers, I will be glad to send you the names, addresses, and phone numbers of my suppliers.

Zinc chloride can be used as a soft-solder flux and also will work on stainless steel. It is the equivalent of zinc dissolved in hydrochloric acid (muriatic acid). Do not use any acid flux when soft soldering electrical connections. Use solder paste or resin base flux.

Ruby fluid is a prepared flux for soft soldering and is available in many hardware stores. It is an acid based flux. (See figure 1e.)

Tix is a prepared flux for soft soldering and is well recommended for soldering on costume jewelry.

Anti-fluxes cause metals to oxidize. They oxidize metal, or places on metal, and will not allow solder to flow. This can be one way to control where the solder flows. Anti-fluxes are not completely practical for jewelry use because the places to be soldered are often so small it is difficult, if not impossible, to apply them. We usually have to control the flow of the solder with application of flux and heat. Much practice and experience is involved before we can become proficient in soldering in very small and difficult places.

Yellow Ochre is a powder and when mixed with water can prevent the flow of solder to an unwanted area.

Tix anti-flux is a liquid and can be applied with a small brush to keep solder from flowing to unwanted areas.

Shielding against heat is as important as shielding against oxidation. When sizing, shanking, or applying heat to stone-set rings or enameled pieces of jewelry, the parts should be shielded against the heat. Even though many stones will stand heat, many will not, so if in any doubt these parts should be shielded from the heat that is required to flow the hard solder. There are four types of heat shields that I use regularly and these will be listed and comments made. These four include wet sand (Figure 2a), manufactured "Heat Shield" (Figure 2b), black putty-like substance (figure 2e), and wet tissue (not shown). Although there are many fluxes that are shields against oxidation, two in particular, boric acid or Borax, are used for dipping the article to be soldered, then they are burnt off leaving a coating to shield the finish surrounding the solder joint. (See Figures 2c and 2d.)

One question that has been asked many times is should borax and alcohol be used or boric acid and alcohol. I have tried both and prefer boric acid and alcohol because the alcohol will dissolve more boric acid which leaves a heavier coating on the surface to be protected from oxidation. Either mixture will, however, give the protection against oxidation that is needed. When making solder joints on gold-plated or gold-filled metals, this protection saves the oxide coating around the solder joint which must be removed by pickling and polishing. Considering the thin coating of gold, especially on electroplated metals, this procedure can save polishing the gold coating away. Remember this does not protect against heat damage, only oxidation.

It is important not to confuse shielding against oxidation with shielding against heat. Even in many ring-sizing jobs such as rings containing stones, enamels, or other hard solder joints, they should be protected from heat.

The wet sand method (Figure 2a) can be used by sticking the head of the ring into the wet sand, leaving the bottom of the shank that is prepared for soldering protruding so that heat can be applied. Although gold is a good conductor of heat it will require more heat to flow the solder because some of the heat will be absorbed by the wet sand.

Manufactured "Heat Shield" is a creamy substance that can be spread on and around the portions of the jewelry to be protected (see Figure 2b). The black putty-like substance (Figure 2e) is a substance



Figure 1.



Figure 2.


Figure 3.

that was available but is no longer due to its asbestos content. There are some modeling clays that are nonflammable and can be obtained through hobby shops which will do the job. Although the black putty is good protection to a point it is extremely hard to clean off.

Wet tissue is not shown in the illustration but is the heat shield that I use almost completely. I use a piece of paper toweling and cut it into four pieces which are folded to form a strip about 1/2" to 3/4" wide. The strip is immersed in water then wrapped around the top of the ring containing the stones or enamel to be protected. If the heat dries out the paper, especially when working with very heavy gold and silver rings, and it begins to scorch you will smell it. Immediately remove the heat so no damage will be done. Wet the tissue again and use more heat so the solder will flow before it dries out the wet tissue. If this cannot be done, then the stones should be removed.

Cleaning shielding materials, with the exception of the putty-like substance, is usually easy. Most are water soluble and can be cleaned with a brush and soap and water, or cleaned in the ultrasonic with water soluble solutions.

Pickling solutions and pickling plays a very important part in jewelry crafting and repair. Many questions have been asked about pickling and pickle solutions. First we should understand what the pickle does for us. The old pickling solution for nonferrous metals is diluted sulfuric acid. It dissolves oxides and loosens foreign materials that can be on metals to be soldered which makes it easy to pre-clean. Sulfuric acid should be diluted as follows: 10% acid and 90% water for a heated solution, and 20% acid and 80% water for a cold solution. *In diluting, never pour water in the acid; instead pour the acid in water.* Pouring water in acid causes it to splatter which creates a hazardous situation.

Many diamond rings come in for repair (especially ladies engagement rings) with a soapy or detergent deposit built up under and around the diamonds. This is difficult to remove. Even an ultrasonic cleaner will often not remove it. I have learned to boil these items in pickling solution for a few seconds and then use the ultrasonic cleaner to pre-clean; it works well.

For a small shop with only one jewelry craftsman working, using a heated pickle pot is not usually practical. Use a copper pickle pan and dip it into pickling solution, then hold the pan along with the piece of jewelry over the torch and bring the solution to a boil for a few seconds. Then empty the pickling solution back in its jar, and rinse the piece in a jar of water. This is a quick and effective way to quickly do a pre-clean or after solder pickling to remove oxides and fluxes (see Figure 3).

To make your copper pickle pan you can use a copper pipe cap that is available at plumbing supply houses in sizes from 3/4" to 1-1/4". These sizes are adequate for most jewelry jobs. Figure 4 shows the components for making such a pan. It also shows one finished, as well as a manufactured pan that can be purchased from your jewelry tool supplier.

Any ring or piece made of nonferrous metal that does not contain stones or enamel can be quenched immediately after removing the heat. If it is still hot enough to sizzle, it will save boiling it in the pickle because the oxides and fluxes are removed or loosened.

The next step is to use a bronze bristle brush wheel on the polishing motor which will burnish the soldered place and surrounding area to a bright clean finish.

Since sulfuric acid is a somewhat hazardous chemical to use, there has been in recent years a substitute pickling chemical that removes most of the danger found in acids. "Sparex" is a safe substitute for sulfuric acid. It is a granular dry acid compound specially made for pickling, cleaning, and removing surface oxidation from nonferrous metals. It is nonflammable and non-explosive. This pickle substitute can be used in exactly the same manner as the sulfuric acid pickle.

The next article will be a continuation of this article and will cover torches, soldering machines, pre- and finish-cleaning, drilling, use of the flex shaft tool with burs, prong and bead replacement, and where to obtain replacement stones, gold, and silver.

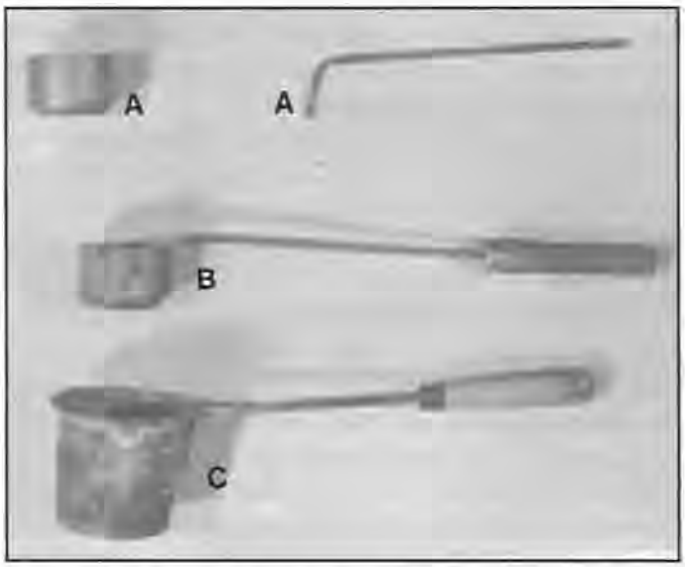


Figure 4a: Copper pipe cap and 3/16" brass rod. Figure 4b: Rod silver-soldered to cap. Figure 4c: Manufactured pickle boiling pan.

AWI MATERIAL SEARCH NETWORK

EDITOR'S NOTE: This column is designed to work in conjunction with the AWI Movement Bank. If you can supply any of the items listed here, please send details to the Material Search Network. **Do not send the items to AWI.** Members requesting these items will be advised of their availability, and will contact you directly.

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9B-6 Movado, 58, set bridge, Factory #445

9B-7 AS, 895, set bridge, Part #445

9B-8 Bulova, 17P, LePhare, 17L, winding pinion, #410

9B-9 Rolex, 1030, crown wheel, Factory #6950

9B-10 Zenith, 359, Pocket Alarm, 17 1/2 L, threaded pallet arbor

9B-11 Russian, Raketa, minute wheel, #2609

9B-12 Russian, Molnia, balance staff, #3608

9B-13 Hampden, 12S, Nathan Hale, Thin Model, balance complete

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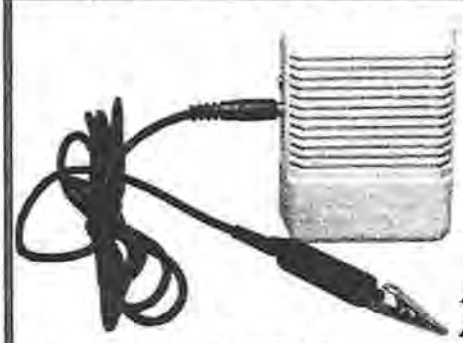


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REPAIRING MECHANICAL WATCHES & CLOCKS

A COMPLETE SERIES OF BENCH PRACTICES

JEWELING, PART 7

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

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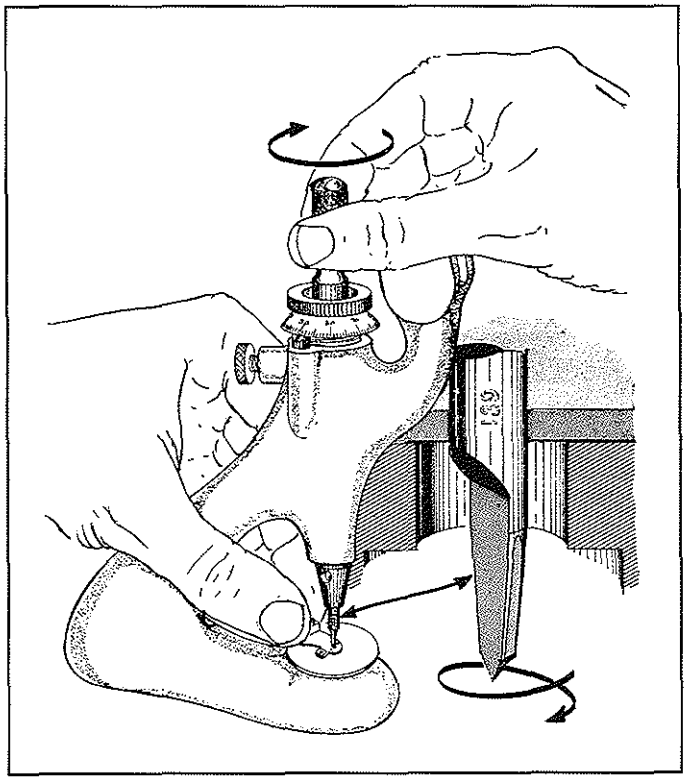


Figure 47. Watchmaker carefully reams hole for jeweling, handling reamer and holding plate (left). Enlarged view of reamer (right) shows that reamer cuts through the hole so that the reamer's cylindrical smoothing section is within the hole.

Friction Jewels

The bezel-set jewel was designed to be held by a rim of metal pressed over its edge and a bevel for this purpose was provided. In a friction jewel, on the other hand, the gripping surface is the cylindrical wall of the hole. Keep this in mind when setting a friction jewel. (See Figure 47.)

Figure 48 shows three types of friction jewels: olive-holed, domed-balance jewel; straight-holed plate jewel; cap jewel. (The parts of the jewels are labeled for future reference.) Notice that balance and plate jewels have the chamfered or beveled edges on the same side as their oil sinks. When inserting jewels such as these two, press with the oil sink down (to start the jewel into the hole). Use a pusher only slightly smaller than the diameter of the jewel, otherwise one or both edges of the pusher may contact the edge of the setting, preventing the jewel from being pressed to the correct depth; an oversized pusher may also damage the setting by scoring its sides.

Figure 49 shows a plate jewel being pressed into a train bridge. Notice that the jewel is inserted from the bottom of the bridge (which is facing upward) so that the chamfered edge of the jewel helps the jewel into the setting. The oil sink faces the top of the bridge.

When setting a flat-faced jewel flush with the plate, the watchmaker may use a pusher considerably larger in diameter than the jewel and the setting and thus obtain a firm, flat seating for the jewel (flush with the plate). (See Figure 50.)

When pressing in a jewel, the micrometer stop governs the distance the jewel is to be pressed into the plate. However, press the lever firmly so that the jewel is inserted the full depth of the micrometer allowance. Adjust endshake by twisting the micrometer feed screw.

Balance Jewels

When replacing a bezel-set jewel with a friction jewel, use friction jewels and settings that are as close as possible to the setting and appearance of other jewels in the watch. Among the three types of friction jewels (described previously) which may replace the bezel-set jewel is the domed balance jewel.

Most balance jewels made today are "bombe"—their top surface is domed so that the capillarity of the oil (in its contact with the domed jewel and the flat cap jewel) will cling to the hole where it is needed. When this type of jewel is inserted, use a pusher which makes proper contact with the domed surface. Figure 51 shows a "concave pusher" (one of a set which is supplied with most friction jeweling tools) inserting a convex or "bombe" balance jewel. This type of pusher distributes its load of

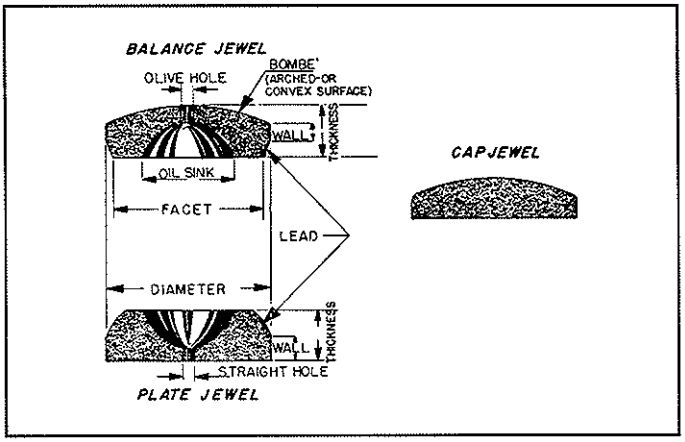


Figure 48. Types of friction jewels—balance, plate, and cap—and their component parts.

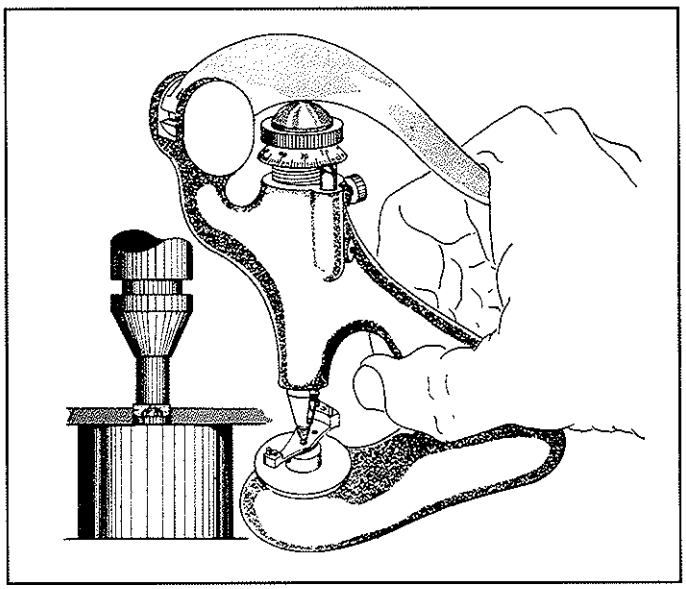


Figure 49. How a plate jewel is pressed into train bridge. Note micrometer stop against pusher-spindle-head. Endshake is adjusted with this stop.

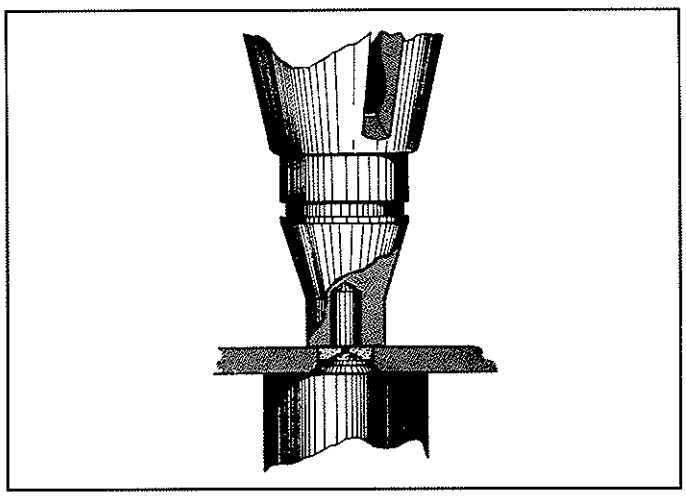


Figure 50. When a flat-top jewel must be pressed in flush with plate's surface, use a large diameter (flat) pusher.

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CORRECTIONS

We hate to make errors but we want to correct two that were made in the March issue, Volume 21, Number 3.

A Practical Course in Clock Repair – Page 26

In the formula appearing in the second column

$$AB + C = D, \text{ then } A = \frac{D}{B + C}, \text{ or } B + C = \frac{D}{A}$$

parentheses were left out between A (B + C) = D correct your copy on page 27 to read

$$A(B + C) = D, \text{ then } A = \frac{D}{B + C}, \text{ or } B + C = \frac{D}{A}$$

Technically Watches – page 28

The illustrations appearing over the captions "Figure 8" and "Figure 9" should be reversed.

approximately fifteen pounds pressure (amount required to press such a jewel into a hole .01 mm smaller than the jewel) evenly on the jewel without danger of breaking the jewel.

Figure 52 shows a cross-section of a pusher with a spring center point. This type is very desirable because the jewel is automatically kept in the center of the pusher, permitting more precise placing of the jewel in its hole (without the probability of the jewel shifting to one side and not lying flat after it is set). A pusher with a spring center point may be used to insert both convex and flat hole jewels. Through constant use, this pusher with its bell-shaped surface becomes distorted and can cause jewel breakage unless it is disassembled and repaired. For this reason, these pushers are constructed so they easily can be taken apart; make a one-fourth turn of the slotted top plug (releasing the spring), and remove the center point through the rear of the pusher. Sharpen the center point on a lathe and grind the pusher to the required shape.

Adjusting Endshake in a Friction Jewel

If a wheel or pinion has too much endshake, the wheel or pinion can easily be adjusted to the desired tolerances with the friction jeweling tool: (1) remove the bridge or plate from the movement and place it on a flat stump (anvil); (2) fit a pusher of slightly smaller diameter than the jewel in the pusher spindle; (3) lower the pressing lever gently until the pusher makes contact with the surface of the jewel; (4) raise the micrometer stop until it touches the underside of the spindle head (or lower the micrometer feed to permit the pusher to make contact with the jewel). For example, to reduce the endshake .05 mm, turn down (clockwise) the micrometer feed five notches (see Figure 53). This permits the pusher to go down that much lower, forcing the jewel deeper into the setting.

Increasing Endshake

The operation of increasing endshake or removing a friction jewel are much the same. When increasing endshake, push the jewel outward. To accomplish this, select a hollow stump (anvil) with a hole *slightly larger* than the diameter of the jewel and place the bridge or plate on this stump so that the oil sink of the jewel faces the pusher (upward).

In selecting a pusher to force the jewel *outward*, choose one with a diameter as wide as the facet of the jewel (see Figure 54). A larger pusher may break the jewel and ruin the setting; a smaller pusher enters the oil sink and may break the jewel.

Lower the pusher gently to contact the jewel and turn the micrometer stop until it contacts the pusher spindle head. Turn down the micrometer stop as required to increase the endshake, and press the push-lever to push the jewel outward. This operation actually is the same as decreasing the endshake except that the bridge or plate is reversed on the hollow stump.

In case the jewel must be removed, adjust the micrometer stop to permit only as much thrust as necessary, otherwise the pusher may go too deep and its tapered back section will plunge into the hole, ruining the plate or bridge.

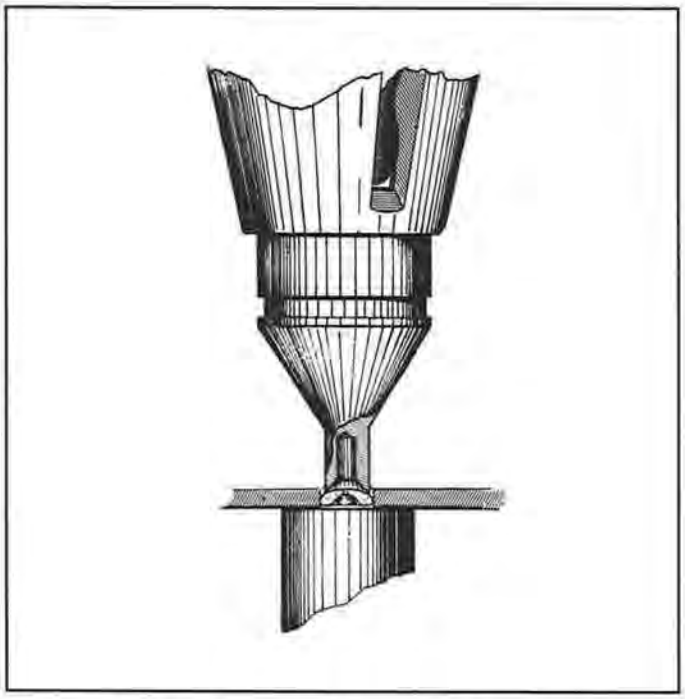


Figure 51. Pusher presses in convex balance jewel.

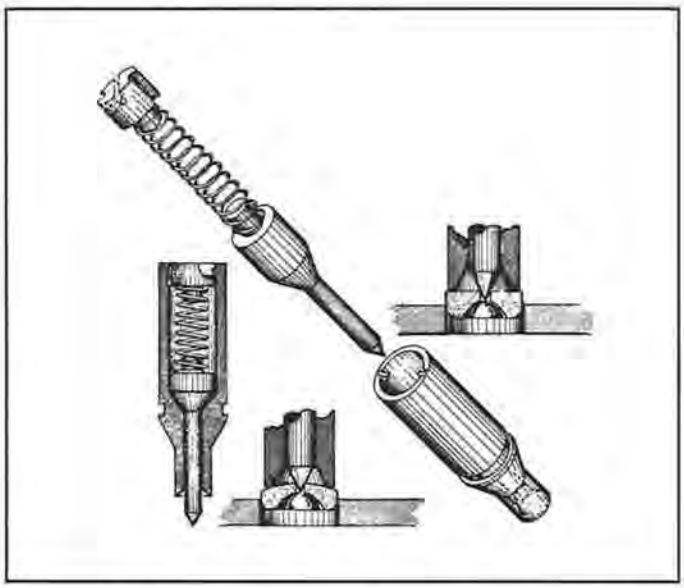


Figure 52. Concave pusher with spring center point. This type pusher centers the hole jewel and makes certain that pressure is equalized. It can be used with both convex and flat jewels.

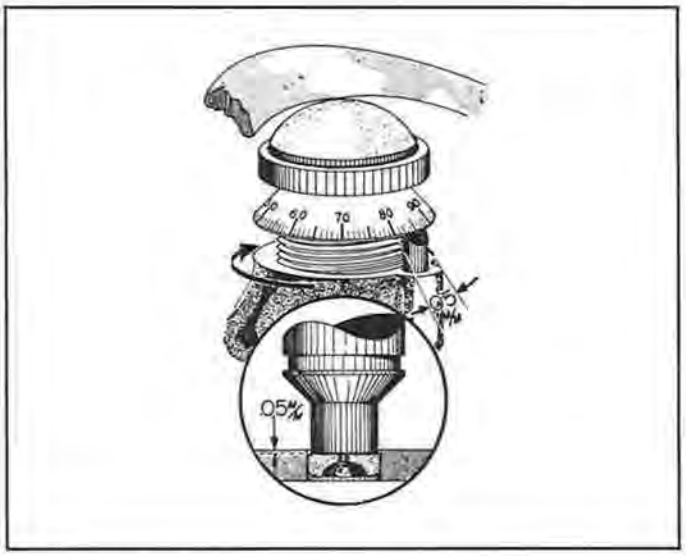


Figure 53. Each mark on the micrometer allows a vertical movement of .01 mm to the pusher. Arrow indicates direction of turning.

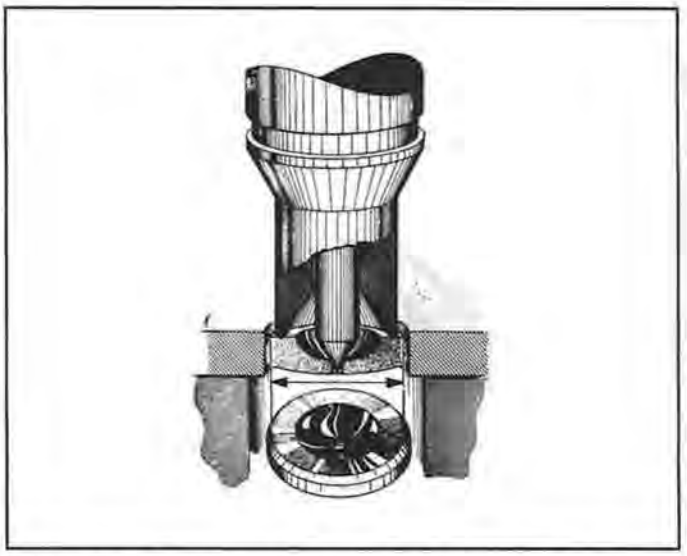
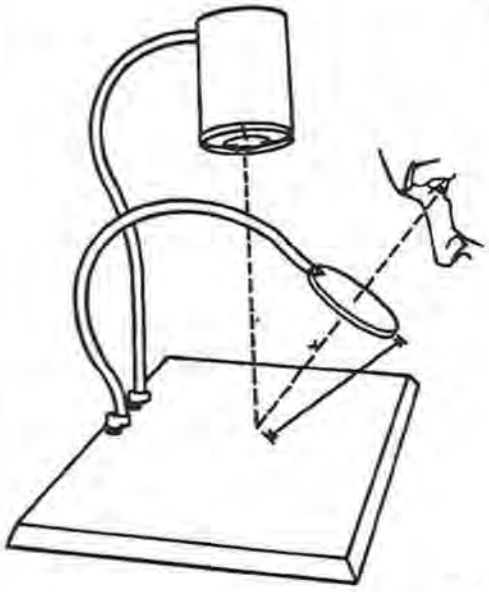


Figure 54. Select a pusher that is of the same diameter as the facet of jewel being pushed out.



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EDUCATION UPDATE

By James E. Lubic

This month we are going to do things a little bit differently for Education Update. As you well know, a picture is worth a thousand words. Please take a few minutes to really look at the pictures. Project Extend and the Academy have been very active.

We would also like to ask any members willing to donate Big Ben alarm clocks to please mail them to AWI Headquarters. We need the oldies but goodies that were made of metal. Please do not send any of the ones containing plastic parts of any kind. These will be used in the Correspondence Course for Clockmaking and Project Extend.

The other item we are looking for are the Urgos UW 32 series Grandmother clock movements. If you have any of these that you have exchanged and wouldn't mind shipping them to AWI Headquarters, we would be glad to accept them.

Remember to check the back cover of the magazine for the latest in the schedule of training courses.



Twenty-First Century Watchmaking Class (left to right). Kneeling: Nestor Hincapie, Jim Lubic. Middle Row: Dale LaDue, Chris Gurule, Chip Lim, Mark Baker, Bill Pleiman, Bill Burnley, Instructor William O. Smith, Jr. Back Row: Phil Stoller, Steven Speech, Will Overturf, Vince Dillon, Robert Waters.

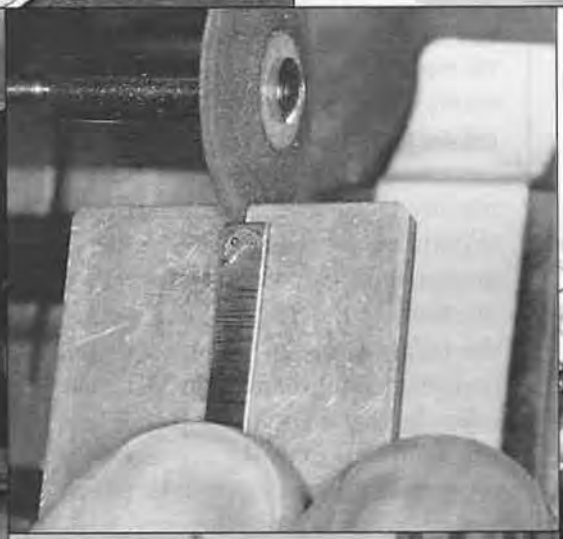
Photos courtesy of Dale LaDue and Mary Smith.




LIBERTY





















FROM THE WORKSHOP

By Jack Kurdzionak

Fitting a New Metal Clock Dial

Murray Falk of Calgary, Alberta, suggests the following method to cut correctly placed winding holes in a replacement metal dial. First locate a piece of carbon paper, lay it face up on the movement with the movement in its case lying on its back. Place the dial face up with the center hole in the right place over the center arbor. Making sure the dial has the numeral 12 at the right place, touch the dial to the winding squares and wiggle it a bit to make a mark. With a tiny drill not over 1/8", pierce the dial from the back. The idea of making a small hole at first is so you can now adjust the holes up to about 1/8" in any direction with a file or a reamer. Put a square of masking tape on the front surface of the dial over the holes being filed to protect the surfaces adjacent to the holes. If you are using a file, file from front to back only, so the tape is being cut away as you file. When you are satisfied that the holes are in the right position, enlarge them to fit the grommets that you will be using. Using a special sheet metal drill is recommended but not necessary. If you will not be using grommets, follow the same procedures, just be a little more careful.

A Quick Check for Bent Teeth

Murray Falk of Calgary, Alberta, suggests the following quick check for bent teeth on a mainspring barrel. Clockmakers working on French time and strike clocks are familiar with mainspring breakage. When the mainspring breaks near the inner end, the recoil from its breaking can cause damaged teeth on its barrel and damage to the next wheel and pinion in the train. This type of damage can also result if the mainspring power is let off too quickly. Bent arbors can be ascertained quickly as well as broken pinion teeth and bent pivots but slightly bent mainspring barrel teeth are more difficult to spot. My method of checking this is quick and reveals the defect at once. I simply roll the two mainspring barrels around each other, holding them in contact so that the teeth mesh fully all the way around. The bent tooth will be felt as a slight interruption to the smooth engagement of the teeth at the defective tooth. Straightening the tooth has solved the problem. Naturally this works only when the two barrels have the same size teeth, which is nearly always on the clocks I have handled.

Fitting a New Balance Platform

When necessary, we fit a new platform balance assembly to French Carriage clocks. These are mounted on top of the movement with four screws going through holes in the platform into the front and rear plates of the movement. For many years these platforms were supplied with large slots machined into them so that the platform could be mounted, screwed down, and adjusted for depth of the escape wheel with the contrate wheel below. These slots were ugly but functional. The platforms we have been purchasing for the last few years are now being produced with no holes or slots for mounting them. Fitting them to the plates has become a bit of a challenge.

Guessing at where to place the holes in the platform is a bit risky and may lead to some large and unsightly holes. To avoid this result you might try this method. Let down the mainspring power and remove the old platform, place the new one on the movement to check for fit and clearances. Make sure that the contrate wheel engages with the escape pinion, that the regulator will have some space, and that the platform will fit properly on the finished job. If it meets all of these requirements. make up two steel pins which fit closely, without binding, into the platform screw holes in the clock plates. These pins should be just long enough to protrude slightly from the screw holes. Put a sharp point on one end of each pin and a flat on the other end. Place the two pins into the front or rear clock plate with the points protruding. Place the new platform on the plate and carefully adjust it so that the contrate escape wheel depth is correct and the platform is positioned correctly on the movement. Tap the platform gently with a fiber-faced hammer just above each pin while you hold the platform in place with your other hand. This should make two prick punch marks on the lower surface of the platform which will indicate where to drill for each screw. Drill the two holes and try the platform with just two screws holding to the movement. Wind the clock mainspring a few turns and check for smooth running. If all is OK, remove the platform and use the two pins in the other plate for locating two more screw holes. This time you can hold the platform to the movement with two screws in

the first two holes you drilled. Again, tap with the fiber hammer and drill two holes where the new punch marks have been made. You now have a platform with four correctly positioned holes which will fit as nicely as the original. *Jack Kurdzionak*

Handy Clamp

Committee member David J. Carlson of Indianapolis has the following suggestion for a tool made from a vise type clamping pliers. As shown in the photo, a piece of brass or soft steel (3/4" x 3 1/2" x .080") was silver soldered to the back of the fixed jaw. The tension spring must be removed from the pliers during the soldering operation.

The second photo shows the pliers clamped in a vise and holding a movement. The long reach of the pliers can be used to "grab" a movement in any position. The assembly is also rigid enough to use as a test stand.





The marks from the jaws are minimal. For highly polished objects, a piece of leather or paper tape can be used to mask the jaws. For the very ambitious, the jaws can be lined with brass strips silver soldered in place.

Thanks

Suggestions have been received from H.M. Bill Bishop Jr., David J. Carlson, Clifton Conn, Gary Crighton, Murray Falk, Bob Hay, Ted Huguelot, Horological Association of Maryland, J.M. Huckabee, Robert Porter, Bill Schroeder, and Lou Roza. Thanks to all of them for taking the time to compose their ideas and send them to the committee for use in this column in its first seven months. If someone has written to me for this column, and his/her name is not listed, it is due to my omission. *Jack Kurdzionak*

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A Practical Course In Clock Repair

Unit 3

Motion Work Calculations

By John P. Kenyon, CMC

Motion work differs from other clock mechanism gear trains in that it is designed for a step down in rotational speed. In other words, the pinions are the drivers and the wheels are driven. The minute hand is fitted to the center shaft which turns once per hour. To indicate time, the hour hand turns one-twelfth of this rate; thus, the gearing in this train is designed to have a twelve-to-one reduction ratio. Since this mechanism is linked to the indicating part of the clock, it is sometimes referred to as the dial train.

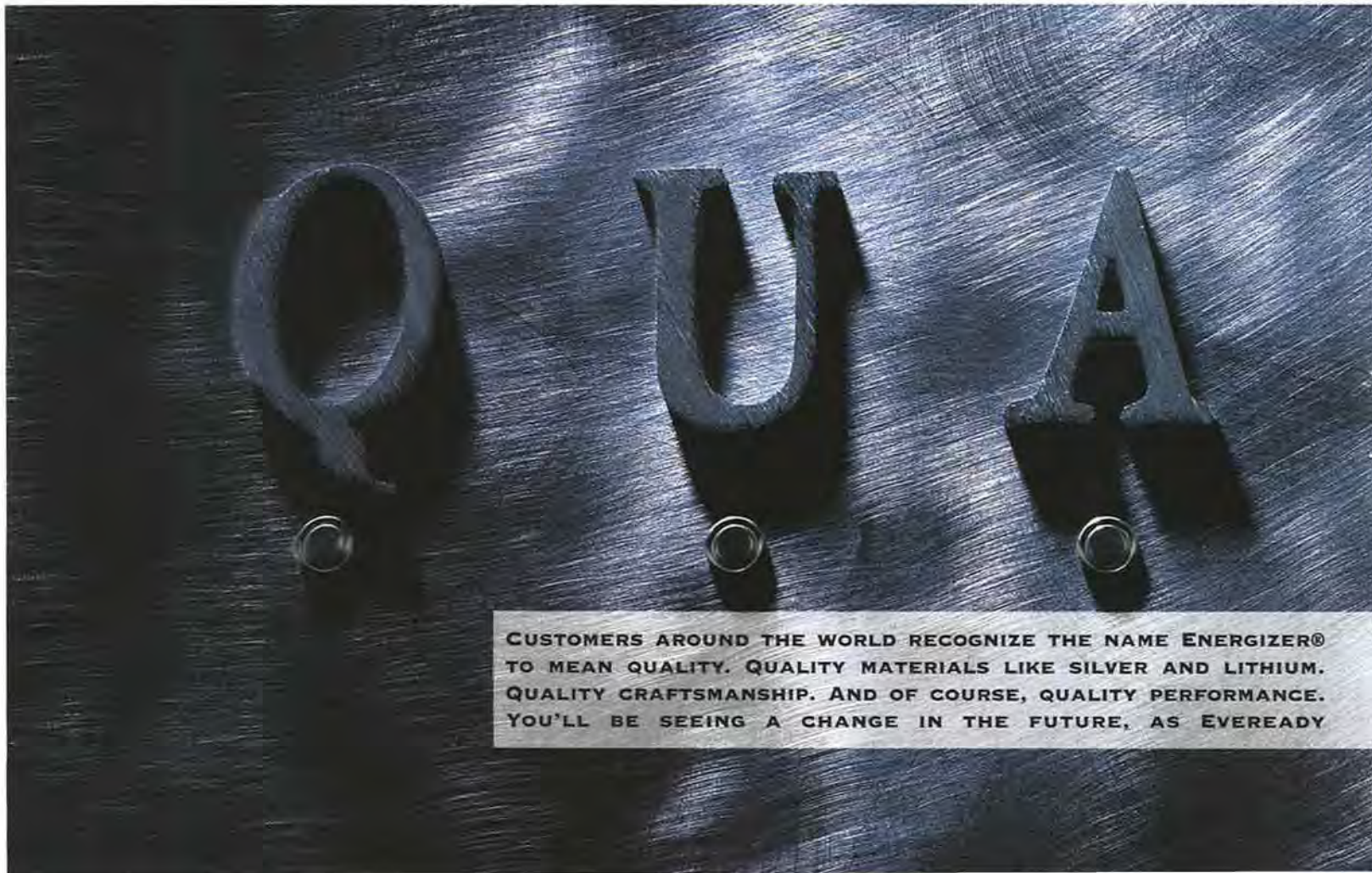
The dial train may be composed of many different combinations of wheels and pinions, as long as the combined ratio equals twelve (the product of the wheel teeth divided by the product of the pinion leaves). To define by formula:

$$\frac{MH}{cm} = 12$$

M = minute wheel teeth
H = hour wheel teeth
m = minute pinion leaves
c = cannon pinion leaves

A. Suppose that the hour wheel has been lost.

$$\frac{MH}{cm} = 12$$



M = 30
H = (X)
m = 10
c = 10

Substituting the values in the equation:

$$\frac{30 \times (X)}{10 \times 10} = 12$$

$$\frac{12 \times 10 \times 10}{30} = (X)$$

X = 40 teeth in the hour wheel

B. Suppose that the cannon pinion has been lost.

Using the same formula and values:

$$\frac{30 \times 40}{(X) \times 10} = 12$$

$$\frac{1200}{10(X)} = 12$$

$$\frac{120}{12} = x$$

X = 10 leaves on the cannon pinion

C. If the minute wheel and pinion are lost.

Let X = teeth in the minute wheel
Let Y = leaves in the minute pinion

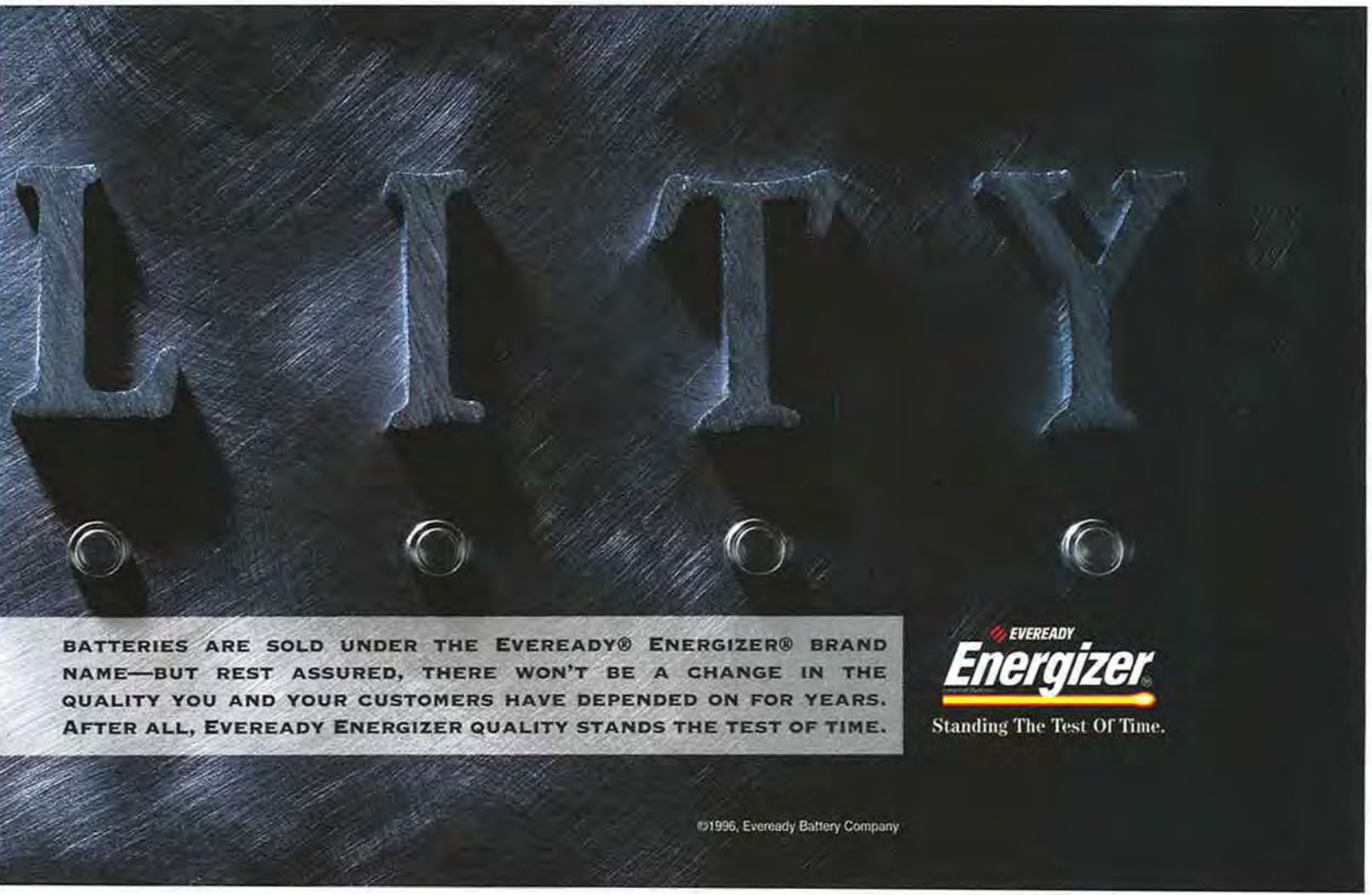
$$\frac{(X) \times 40}{10 \times (Y)} = 12$$

$$\frac{(X)}{(Y)} = \frac{120}{40} = \frac{3}{1}$$

Therefore, the ratio of 3:1 indicates that the minute wheel must have three times as many teeth as the minute pinion has leaves.

Combinations that will work are:

M	18	24	30	36	42	48
m	6	8	10	12	14	16



TECHNICALLY WATCHES

ANTIQUE WATCH RESTORATION, PART CXXXVII

ADJUSTING WATCHES TO POSITIONS (CONTINUED)

By Archie B. Perkins, CMW, FNAWCC, FBHI
© 1997 (All rights reserved by the author)

One important operation used in the finishing and adjusting of watches is to place the watch in beat. A watch is placed in beat after the hairspring has been centered and adjusted to its proper condition. Any recentering of the hairspring after the watch has been placed in beat will throw the watch out of beat. A watch is out of beat if the noises made by the escapement recur at irregular intervals; that is, the interval between the noises of the R-stone actions and the L-stone actions is different than the interval between the actions of the L-stone and the R-stone. It is very important to have a watch in close beat; otherwise, the watch may not start off by itself from a run down condition as it is being wound.

A watch is in static beat when the pallet fork lies midway between the banking pins without any power on the escapement.

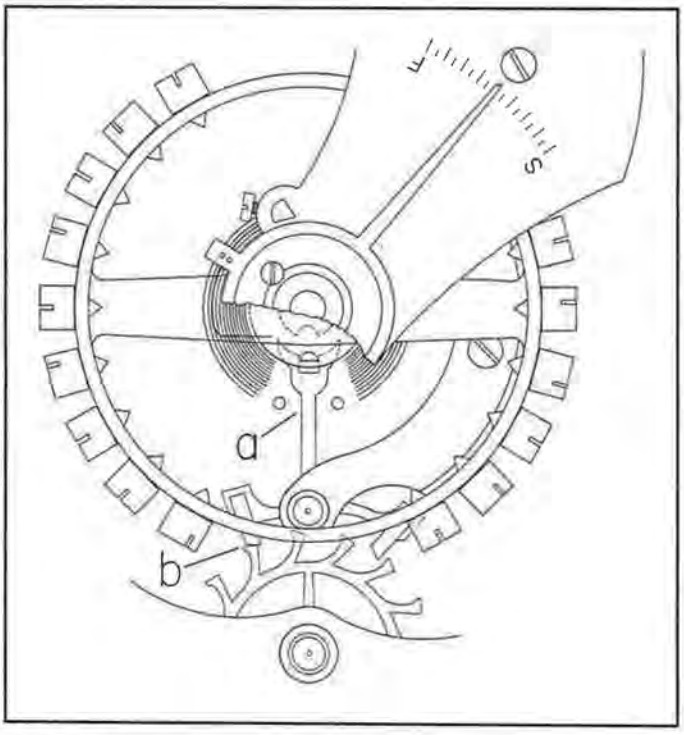


Figure 1.

This condition is shown in Figure 1, View "a." This position of the pallet fork is correct only if both banking pins are perpendicular to the watch plate and planted the same distance from the center line running through the pallet and balance wheel.

If the pallet fork is closer to one banking pin than to the other banking pin, this indicates that the watch is out of beat. To correct this condition, the hairspring collet is turned on the balance staff. If the pallet fork is closer to the R-banking pin, the hairspring collet must be turned clockwise. If the pallet fork is closer to the L-banking pin, the hairspring is turned counterclockwise.

Another condition that can be checked to determine the beat condition of a watch is shown at "b," Figure 1. This test is also done without any power on the escapement and with the pallet fork positioned midway between the banking pins. A needle is used to move an escape wheel tooth against the impulse face of one pallet stone, as shown, then note the position of the tooth on the impulse face of the stone. Now, an escape wheel tooth is brought against the impulse face of the opposite pallet stone and the position of the tooth on the impulse face of the stone is noted. For the watch to be in beat, the tooth should be at the same position on both stones.

A watch should always be checked to make sure that it will start up from a run down state as it is being wound, and an escape wheel tooth is acting on the impulse face of each pallet stone. If a watch rate recorder is being used to check the beat of a watch, then it should record a solid line on the graph paper for the watch to be in beat. If a double line is shown on the graph paper, the watch is out of beat.

Turning the Hairspring Collet on the Balance Staff

Figure 2 shows a method used to turn the collet on the balance staff when the balance is out of the watch and detached from the balance cock. This method is used for lining up the hairspring stud with a positioning dot on top of the rim of the balance wheel, See View "a," Figure 2. *Note: Not all balance wheels have the*

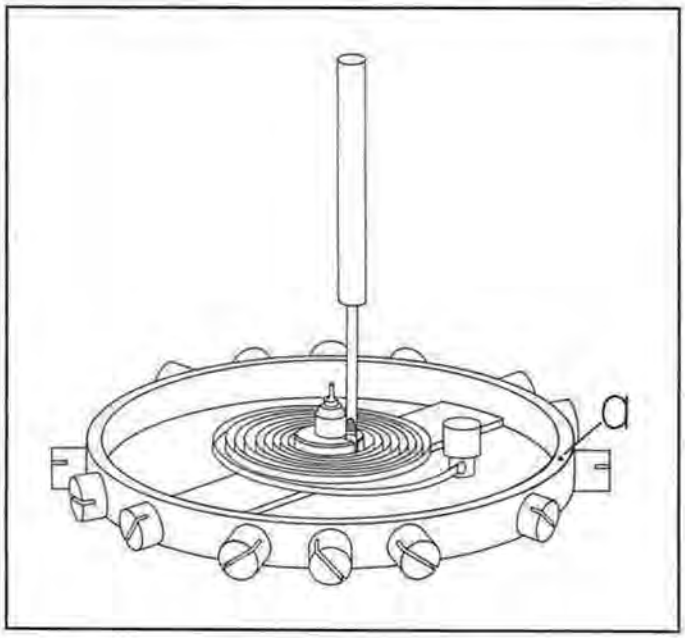


Figure 2.

stud position marked on the rim. This position should never be scribed onto the rim but the rim should be marked with a very small dot.

The hairspring collet is turned with a beat tool by inserting the beat tool loosely into the slot of the collet and giving the tool a twisting motion to turn the collet. The balance wheel can be held in the fingers or on a block of pithwood while turning the collet on the balance staff. The beat tool is made from a small sewing needle by placing the needle into a handle made out of a piece of plastic or aluminum knitting needle material. The sewing needle is ground to the shape of a thin watch screwdriver blade. This same tool and method can be used to remove a hairspring collet from the balance staff. When this method is used to remove a hairspring collet, the beat tool is forced into the slot of the collet to spread the slot so the collet can be lifted off of the staff when the tool is given a combination twisting and lifting motion.

Second Method of Turning the Hairspring Collet

Figure 3 shows a method used for turning a hairspring collet on the balance staff when the hairspring stud is still attached to the balance cock. The balance cock is held on a balance tack, as shown, with the balance wheel suspended by the hairspring. To turn the collet, the balance wheel is held in the fingers of one hand while the beat tool is inserted between the coils of the hairspring and into the slot of the collet. Then, the beat tool is given a twisting motion to turn the collet on the balance staff. *Note: When using this method to place a watch in beat, it would be best to delay oiling the balance hole jewels until after the watch has been placed in beat to avoid disturbing the oil when the balance wheel is removed from the watch to turn the collet.*

Placing a Watch in Beat without Removing the Balance Wheel from the Watch

Figure 4 shows a method that can often be used for placing a watch in beat without removing the balance wheel from the watch.

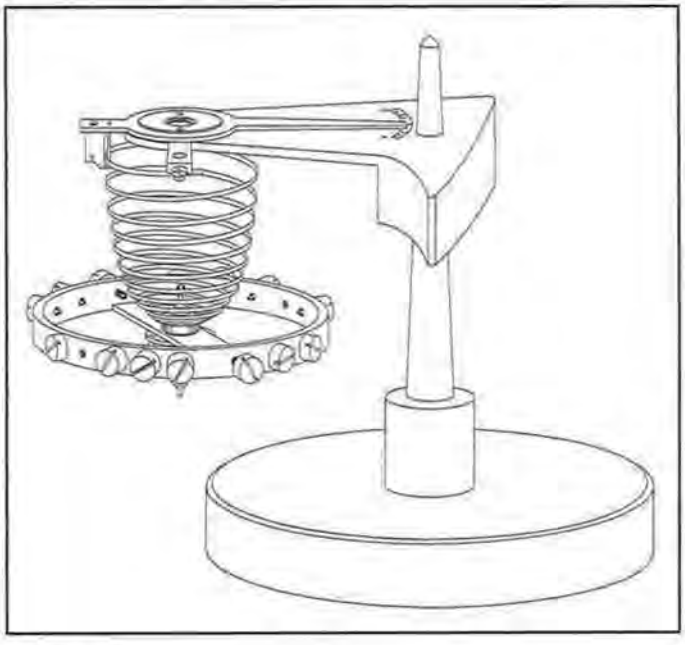


Figure 3.

In order to use this method, there must be a clear view of the slot in the collet and enough space to allow the beat tool to enter the slot of the collet. The watch shown in Figure 4 has an excellent view of the collet slot and space for the beat tool to enter the slot in a position which is above the overcoil of the hairspring. The beat tool is held in the fingers of one hand while the index finger of the other hand is used to turn the balance wheel. The index finger is placed on the outside edge of the balance wheel to be used to turn the wheel while the beat tool is in the slot of the collet. This action moves the balance staff inside the collet which changes the position of the collet on the staff. The index finger is shown in broken lines. *Caution: When turning the hairspring collet with the balance wheel in position in the watch, care must be used to avoid damaging the balance staff pivots or damaging the hairspring.* Very little pressure is needed with the finger on the rim of the balance wheel to turn the wheel when moving the staff inside the hairspring collet. If there is much fear of doing damage when performing this operation, it would perhaps be better to remove the balance wheel from the watch and suspend it on a balance tack for moving the collet on the balance staff.

A Rack for Holding Cased Watches

Figure 5 shows a rack used to hold cased watches while they are being timed after adjustments are made when adjusting watches to pendant positions. The rack is made of hardwood. A watch can be held in any vertical position in the rack.

A Stand for Holding Uncased Movements

Figure 6 shows a stand for holding uncased movements while they are being timed in the vertical positions during the position adjustments. The stand is made of hardwood. There should be different sized slots to accommodate different size movements. Clearance should be provided in the slots for the hands of the watch. The stand allows the movement to be placed in any vertical position.

A Motion Check Stand for the Dial Up Position

Figure 7 shows a check stand for checking the motion of a watch when it is in a dial up position. This type of stand was used by the watch finishers at the Elgin Watch Factory. This stand solves the problem of viewing the movement side of a watch movement when it is in a dial up position. The frame of the stand is made of brass bars and rods. The top of the stand is clear glass.

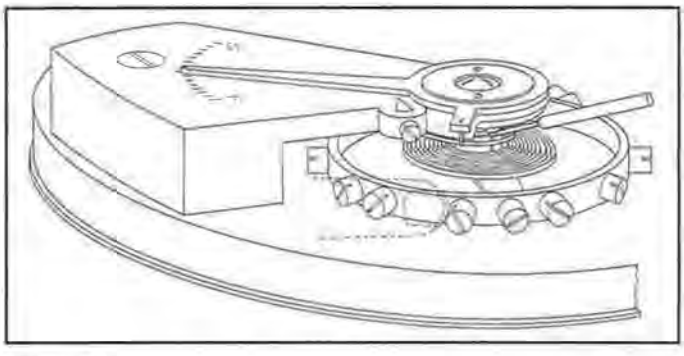


Figure 4.

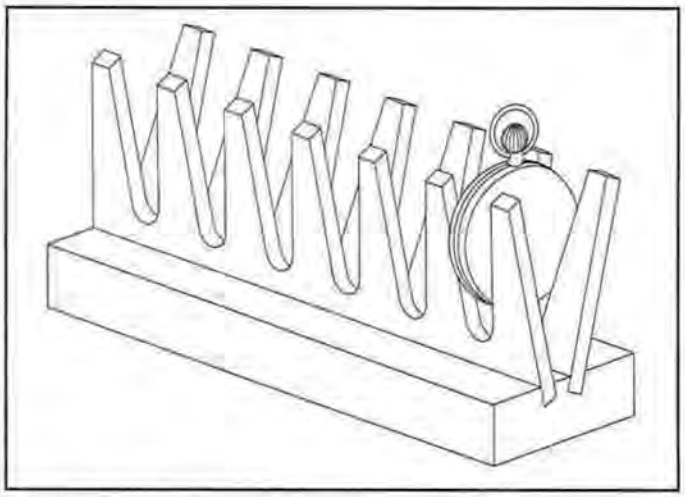


Figure 5.

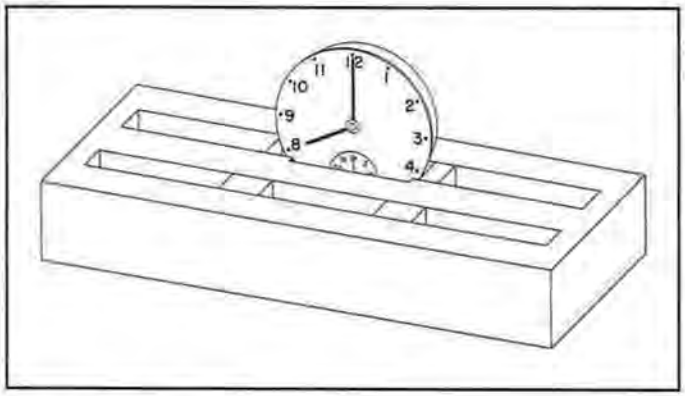


Figure 6.

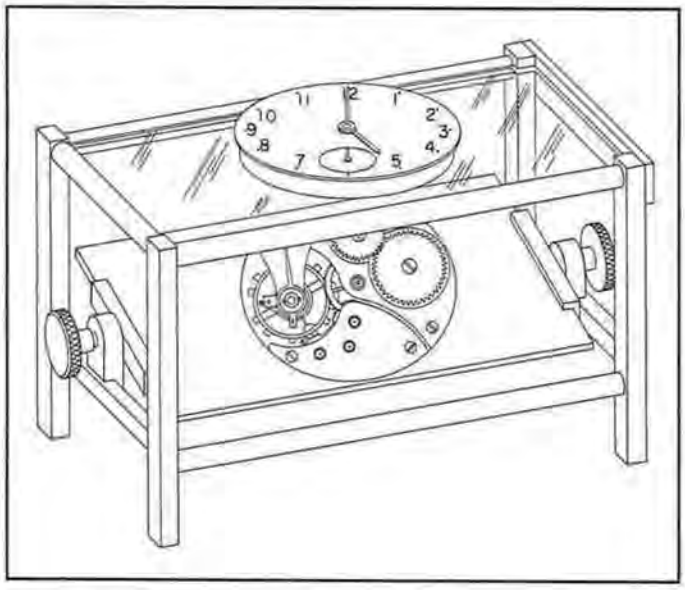


Figure 7.

Below the glass top is an adjustable mirror that can be tilted to any angle by turning a knob at either end of the stand. A watchmaker sitting at the bench can see the movement reflected in the mirror. This allows the motion of the balance wheel to be checked while trouble shooting the watch movement.

Adjusting Watches to Three Positions

When a pocket watch is adjusted to three positions, the positions are dial up, dial down, and pendant up. The three positions of a wrist watch are dial up, dial down, and pendant down.

The first steps in adjusting a watch to positions is to have the watch in first-class mechanical condition. The motion of the watch must be acceptable in all positions. The motion of the balance wheel should be the same in both dial up and dial down positions. The dial positions should be 1-1/2 turns or 540°. The pendant position motion should be no less than 1-1/4 turns or 450°. The arcs of motion given are with the watch fully wound. It would be desirable to have the motion the same in the pendant position as in the dial positions, but this is not possible because of the extra friction present when the watch is in the pendant positions. This extra friction reduces the motion of the balance wheel.

If the motion is different between the dial positions, then the dial position which has the shorter arc of motion should be suspected as having a mechanical fault when in this position. The place to look for the trouble depends somewhat on how much smaller the arc of motion is in the defective position. If the difference in arc of motion is only slight, the trouble could be that the balance staff pivots are shaped slightly different on their ends or they may be finished differently. If there is a great difference in motion between the dial positions, we would look for a larger mechanical fault such as the hairspring rubbing or the pallet fork rubbing.

"Adjusting Watches to Three Positions" will continue next month.

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Continued from page 2.

What better way to gain recognition in your chosen career field and to build on your career than to have an article under your byline accepted for publication in *Horological Times*?

Finally, what I described as an intriguing number of you have requested a "Letters to the Editor" column. I am willing to give it a try and to use the space afforded in this column to answer some of your questions concerning AWI and its policies. While recognizing that agreeing to do this is somewhat akin to trying to give a pet coiffure to an angry wildcat. (One really has to love one's work.) I believe that the members should have a forum wherein they can express their views about their association and its activities. Here's your chance. Address your comments and questions to William J. Ewbank, Executive Director, American Watchmakers-Clockmakers Institute, 701 Enterprise Dr., Harrison, Ohio 45030 or E-mail to Bill@awi-net.org. Please confine your questions to matters of policy or editorial procedure. Technical questions will be routed to the Technical Request section. All questions must bear the name and AWI member number of the questioner. Questions will be printed exactly as received and as space is available. So keep 'em short; and, boys and girls, keep 'em clean.

William J. Ewbank

Continued from page 2.

has AWI done for me?" Then think it over carefully. Think about our crowning achievement, the *Horological Times*, and all the great articles that teach us so much. How many bench courses have you attended?

I just finished the fourth segment of Roy Hovey's lathe course. I can't begin to tell you how it feels to cut a wheel. This feeling is the next thing to being able to walk on water. This course is available to you, providing enough people sign up. Those bench course instructors give generously of their time and talents to see that you are prepared for whatever you will encounter in your work. The list of the aid available to you from AWI goes on and on. Take advantage of it and become the best you can and make a few extra bucks besides.

May spring open your minds and hearts.

M. R. "Buddy" Carpenter

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A DUMPLING EATER CLOCK

David J. Carlson

Just about the time you get a bit tired of the routine repair jobs along comes a clock which reminds you of the creative genius of those in the past and challenges you to put it back in top condition. Such was the case with the clock shown in Figure 1 called "The Dumpling Eater." From all indications the clock was made in the Black Forest region of Germany. The clock stands 30" high, 11 1/2" wide, and 7 1/4" deep. On the top of the clock is a seated figure with a plate of dumplings on his lap. The figure "eats" a dumpling when the loop on the side panel in Figure 1 is pushed down. As received, the owner complained of a random hang-up in the dumpling eating action.

In Figure 2 with the rear cover removed, a typical German square plate time and strike movement is visible. The strike side train is used to drive the "Dumpling Eater" through the second wheel extended shaft and pulley visible on the left side of the movement. The drive belt is a knotted linen cord which drives the automation. Figure 3 is a close-up view of the "Dumpling Eater" at rest.

Figure 4 is a stop-action picture of the automation at the start of the cycle. The dumpling is visible at the end of a wire which comes through a slot in the chest. As the dumpling lifts, it picks up the fork held in the left hand of the figure. At the same time the mouth opens, the tongue comes out, and the eyes look downward at the food. The action is shown schematically in Figure 5. The action is very lifelike and the observer has the impression that the arm with the fork is raising the dumpling. The action continues as the dumpling disappears within the mouth, the chin moves to "chew" the food, and the eyes resume their forward look.

The action of the "Dumpling Eater" is contained within the figure. Access to the mechanism is through the "humpback" section which is pinned to the figure in the rear as shown in Figure 6. The main portion of the action is a drum which carries the wire and dumpling. The drum also carries wires which activate the jaw, the chewing mechanism, and the eyes. The jaw and eye assembly are similar to a cuckoo bird in complication.

Overhaul

Clock

The overhaul of the movement was reasonably routine except for two exceptions. First, in the strike train the fly was soldered to its arbor. I have a real problem with this abortive repair because it takes four times as long to clean off the solder and adjust the tension of the fly as it would if the piece had been repaired correctly in the first place. The added insult was the use of acid core solder which caused unnecessary rust to the arbor and its pivots. The second fault was found in the time side spring barrel. The spring had been "spliced" and showed evidence of imminent failure which could have easily wiped out the second wheel



Figure 1. "Dumpling Eater" clock.



Figure 2. Rear view showing movement.



Figure 3. Close-up of "Dumpling Eater."

and barrel teeth. This finding reinforces the discipline of inspection, cleaning, and lubrication or replacement of a mainspring as a key part of any overhaul.

Automata

To gain access to the "Dumpling Eater" mechanism it was necessary to remove the "humpback" on the figure (see Figure 6). To my surprise and frustration, I found it glued in place. My thoughts at that moment are unprintable. Fortunately with great care and a sharp razor blade the back was removed and the mechanism cleaned. Two 1" lengths of piano wire refastened the back on the figure. It is easy to pry off for future inspection.

The random hang-up in the dumpling eating action was traced to an interference of the fork when it dropped down to the rest position. At times the metal tong on the front of the fork would catch on the rear of the plate carrying the dumplings. Some wear and the resulting looseness of the arm contributed to the problem. After some careful consideration the most conservative and least intrusive on the clock was to supply a leather bumper. The leather bumper is made from a small piece of old thin wallet leather and is formed into a roll 1/16" thick. A very small spot of glue holds it in place. The repair can be seen immediately below the "Dumpling Eater's" hand in Figure 4.

I was indeed fortunate to work on this old clock. I would hope that those of you who do get an opportunity to work on such wonderful horological pieces of history will do your best work to assure their survival into the future!

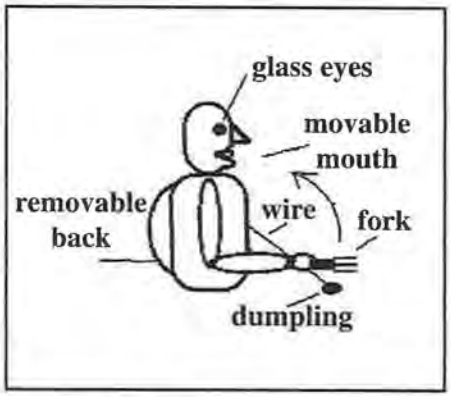


Figure 5. Schematic of "Dumpling Eater."



Figure 4. Start of eating cycle.



Figure 6. Rear view showing removable back.

MOVEMENT BANK DONATIONS

The AWI ELM Charitable Trust provides assistance with hard-to-find replacement parts for vintage watches. When a member needs a replacement part and is not able to locate one through their normal sources, the Movement Bank/Material Search Network often is able to help.

The need is first faxed to the participants in the Material Search process to see if they can supply a new part. If no source is found we then search through the vintage movements that have been donated to the Movement Bank for a usable spare part. A nominal fee of $5 for each part requested is charged to cover the costs involved. The fee is waved if a vintage watch movement is donated for each part requested. The movement should be substantially complete.

YOUR CONTRIBUTIONS OF MOVEMENTS TO THE MOVEMENT BANK WILL INSURE CONTINUATION OF THIS SERVICE FOR PRESENT AND FUTURE CRAFTSMEN. DONATIONS ARE TAX DEDUCTIBLE.

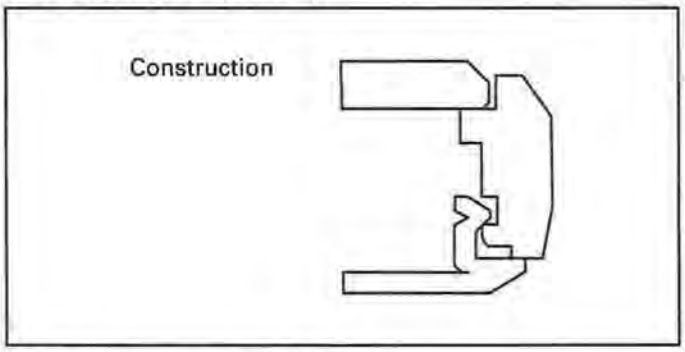
SEIKO CORPORATION

INTRODUCTION OF NEW CASE CONSTRUCTION R2 AND NEW ADHESIVE S-314

New Case Construction

In order to realize a thin, dress type 10-bar water-resistant model, Seiko has developed a new glass-bonding type case construction, to which the code "R2" is assigned. For quality assurance of this case construction "R2," Seiko has also developed a new adhesive S-314 for exclusive use with it. To bond the glass to "R2," therefore, be sure to use S-314 without fail.

(Add "R2" to "chart for each type of case construction" in "Watch Case Servicing Guide 1982.")



New AS construction code R2

New Adhesive S-314

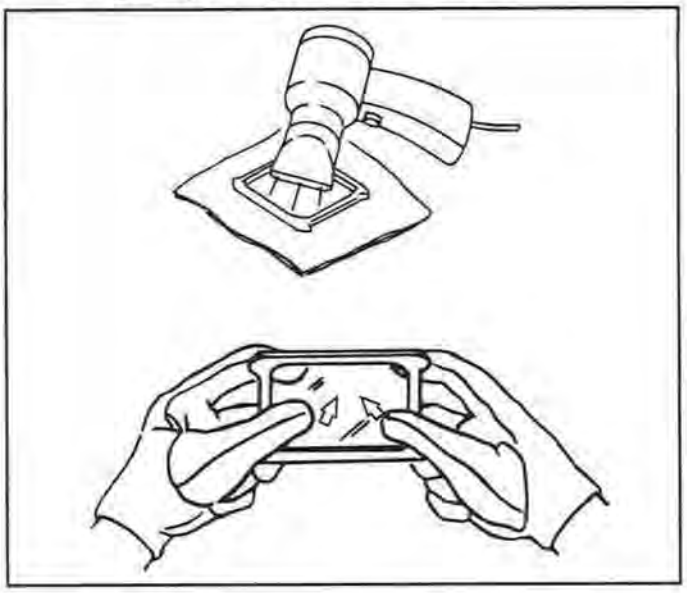
Features

- It is a one-component actinically-cured adhesive (urethane acrylate) that is excellent in water-, shock-, and weather-resistance quality.
- To cure the adhesive, a UV lamp must be used. It cannot be cured by sunlight.
- Being a one-component adhesive, S-314 is free from such handling errors as wrong mix ratio and inclusion of bubbles, thus ensuring excellent workability and stable quality.
- It is an adhesive for exclusive use with inorganic glasses (Hardlex, sapphire glass, and sapphlex).
- Please note that S-314 cannot be used for watches using plastic cases or organic glasses (e.g. acrylic glass).
- Effective use period: two years if stored in a dark room (-10°C~ +25°C).
- S-314 is also available for use with non-water-resistant, 3-bar and 5-bar watches. (Even if S-314 is used for them, however, their water-resistant quality will not be increased to meet the 10-bar standard.)

Bonding Procedure

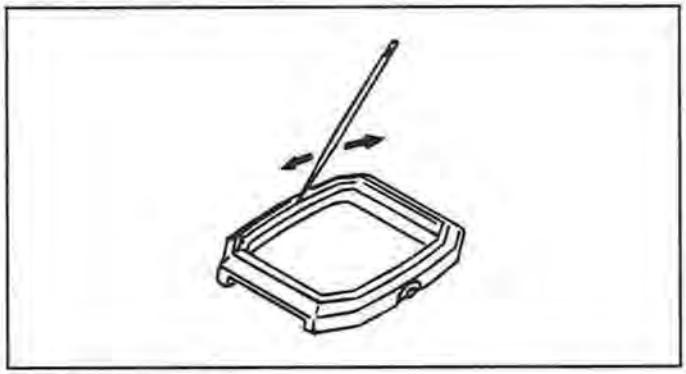
(1) Removing the glass

- To remove the glass, heat the hermetically sealed part of the glass by boiling or using a hair dryer.



(2) Cleaning

- Apply alcohol to the adhesive remaining on the watch case and remove the adhesive and dirt sticking to the case completely.



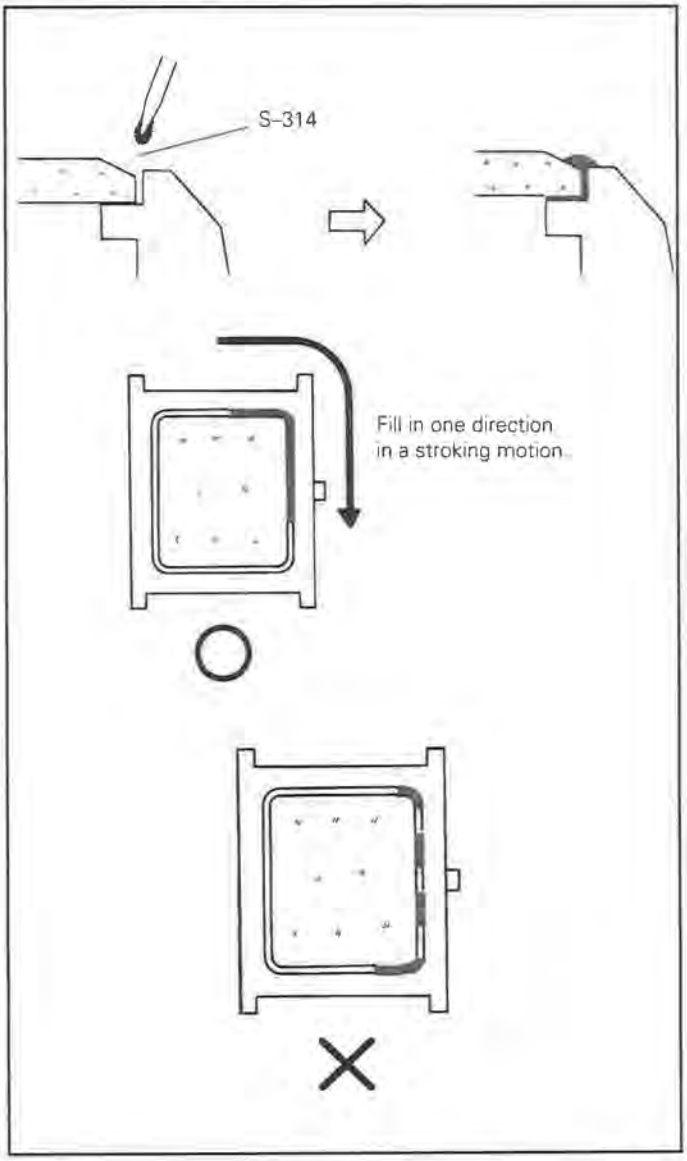
- When applying ultrasonic cleaning to the case, use water or neutral detergent.
- After ultrasonic cleaning, wipe the cleaned surface completely using alcohol.
- Cleaning the case in solvent-containing water will deteriorate the adhesive force of S-314. If the case and glass are cleaned with solvent-containing water, it is recommended to remove the glass again for rebonding.

(3) Applying the adhesive

SAFETY PRECAUTIONS

- **If S-314 is accidentally spilt on the skin, wipe it off immediately and wash the skin with soapy water.**
- **Should S-314 get into the eyes, immediately wash thoroughly with running water for a few minutes, and seek medical advice.**

- **S-314 emits an acrid odor. Handle it in a well-ventilated place.**
- **Never use S-314 where sources of heat or ignition are used.**
- Set the glass onto the case, and use a toothpick or the like to generously apply S-314 to the entire periphery of the glass.
- Wipe off gently with a dry cotton swab all the adhesive outside the groove.

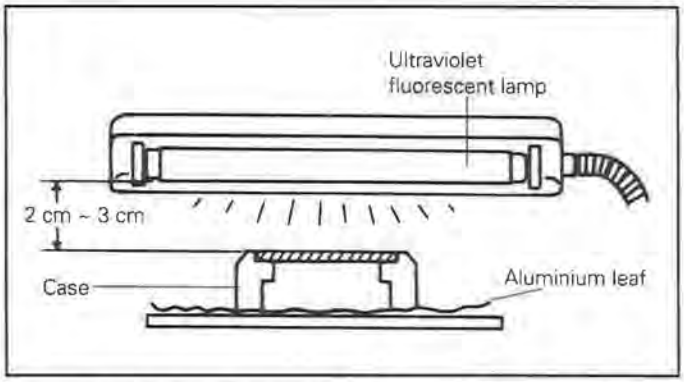


(4) Curing

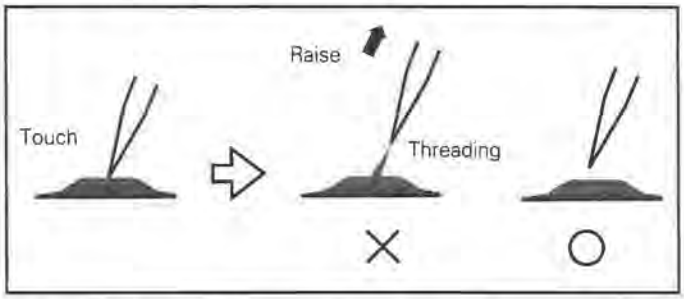
SAFETY PRECAUTIONS

- **When using UV rays, be sure to wear protective spectacles.**

- While the adhesive is being cured, do not touch the glass. (Be sure not to move the glass.)
- Use a tubular ultraviolet fluorescent lamp rated at 15W or 20W (365 nm wavelength) for curing.



- Place the watch case with the glass up. Set the lamp clearance at 2-3 cm and irradiate for more than one hour.



* For checking whether the adhesive is cured or not, touch the adhesive remaining in the service dish with a toothpick or the like.

- The above ultraviolet ray fluorescent lamp will not be provided by Seiko but should be procured by each service center. If it is not available in your area, we will introduce a vendor.
- Please note that this adhesive is not anaerobic and, therefore, will not be cured even if left under natural atmosphere.

(5) Quality check

- After wiping off the case with alcohol, check its water-resistant quality using a water-resistance tester which utilizes the actual water.
- The above bonding procedure should be completed in one stretch from glass removal to curing.
- For details of the bonding procedure, carefully read the instruction manual attached to the adhesive.

Announcement of Discontinuance of S-313

Following the release of S-314, the sale of the conventional ultraviolet ray one-component adhesive S-313 will be discontinued. For the bonding of the glass, please use the new adhesive S-314 instead in the future.

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MUSIC BOX CLOCKS

TWELVE-TUNE MUSIC BOX WITH SIX BELLS, PART 21

By Leo A. Jaroslaw
©1997 (All rights reserved by the author)

Introduction

In this part we will complete the assembly of the movement, install, and test it in the box.

34. Bell installation. (See Figure 21.1.)

34.1. Check bell numbers and lay them out in sequence.

34.2. Release bell on/off lever to "on" position.

34.2.1. Start cylinder rotation.

34.2.2. Observe bell hammers (41) as they move in the hammer slots (40) in the platform (38).

Note: The movement should be free and central to the slots. If not:

34.2.3. Correct any discrepancies by bending the bell hammer wire.

Note: Use wire-bending pliers or other wire-bending tool you use to bend and adjust wires in clocks.

34.3. Assemble bells onto their bell posts (124).

34.3.1. Mount bell springs (125) on the bell posts.

34.3.2. Insert lower felt pad (126) on the posts over the spring.

34.3.3. Mount bells in their numbered sequence.

34.3.4. Insert felt pads to lay on top of the bells.

Note: There should be a felt pad under and on top of each bell.

34.3.5. Thread acorn nuts (127) onto the posts.

Note: Tighten the acorn nuts just enough to lightly compress the felt pads.

34.4. Adjust spacing of bell hammer head to bell.

Note: The starting space should be about 1/16". After a "play" test you may have to re-adjust similarly to what you do with a clock strike against a bell, gong, or chime to provide the clearest sound.

34.5. Run movement and check bell system operation and sound, including on/off lever responses.

Note: If any of the bells have a tinny sound, this may be caused by the hole in the bell having too much clearance with the bell post. Correct by tightening the acorn nut a little. If that doesn't correct, insulate the two metals from contact by wrapping some thread or paper around the post at the bell position. This of course will require some disassembly and reassembly of the bell.

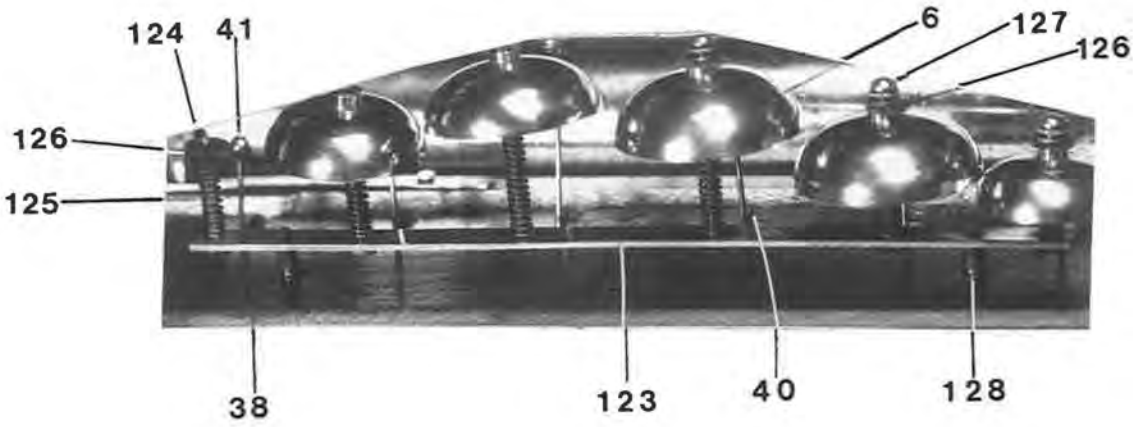
35. The Zither assembly. (See Figure 21.2.)

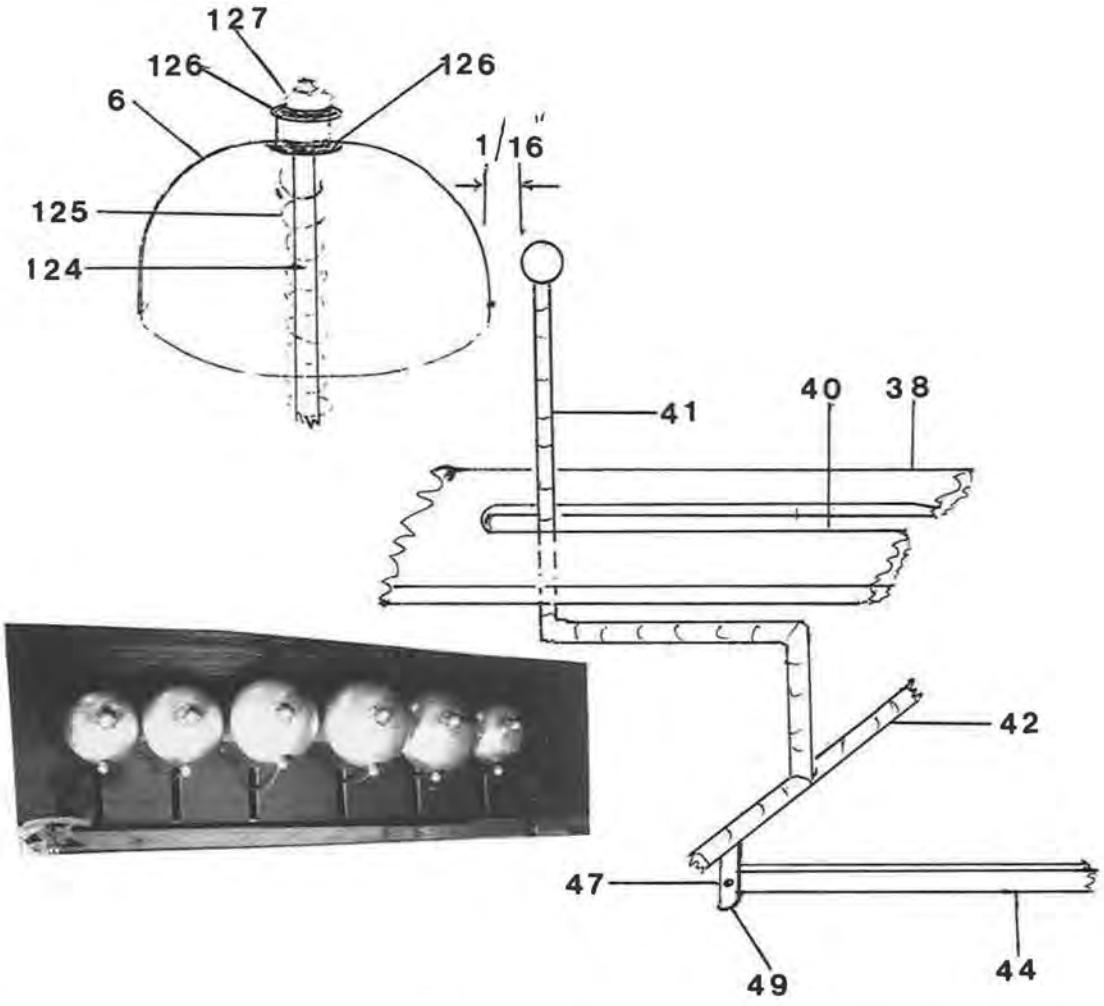
Note: A little background: The zither came into use around 1880 and was quite popular for a while. In some music boxes it was a factory installation. In others it was an added accessory. There are only two ways to ascertain an original. 1) The zither mount bracket is screwed directly to the bedplate. 2) Mention of a zither on the "tune sheet." (The tune sheet was missing on this box.) Those zithers which are attached on the comb with the center comb mount screw/washer (34) could have come from the factory, or added as an accessory when it was a popular fad.

The zither is supposed to change the normal tone to somewhat resemble a stringed instrument (zither). Today many music lovers agree that it adds nothing to the sound. This is especially true if poorly adjusted. Many have been removed over the years, since they don't improve the sound and they hide the visual actions of the comb.

Another reason for removal—when the zither is kept in contact with the comb in a damp condition, over a period of time, the result is rust of the comb. The music box should never be stored with the zither in "on."

This assembly is usually mounted on a bracket (121) over the comb. It usually consists of tissue paper (139) rolled in 6-8 layers, and glued to the recess in the wooden block (140). The block is mounted to a metal plate, usually nickel plated. This





6	Bell	44	Bell Link	125	Bell Spring
38	Platform	47	Link Pin	126	Felt Pad
40	Hammer Slot	49	Bell Rod Extension	127	Acorn Nut
41	Bell Hammer	123	Bell Standard	128	Bell Standard Stud
42	Bell Rod	124	Bell Post		

SCHEMATIC NOT TO SCALE OR FORM

Figure 21.1. Bell components.

plate sometimes was quite fancy (though not on our machine). The plate is attached to the control (120). The control in our movement is quite fancy and also plated. It is hinged and sprung with a short extension which is attached to the mount bracket by the two mount screws (138). On top of the control is a knob (136) to lift or apply the zither (on/off). Also two adjustment screws (137) are accessible from the top of the control to adjust or limit the contact pressure of the tissue paper against the comb teeth when the zither is in "on" mode.

35.1. Loosen center comb mount screw (34) and attach the zither mount bracket (121).

35.1.1. Tighten screw just tight enough at this time to hold the bracket, but allow it to be moved, as required to position the zither assembly.

35.1.2. Check that the bracket can be moved through each of the slots.

35.2. Attach the mount screws to the control, loosely.

35.2.1. Mount zither assembly onto the bracket by inserting the mount screws into the slots in the vertical end of the mount bracket.

35.2.2. Tighten mount screws.

35.3. Check position of zither in relation to comb teeth.

Note: The treble, bass, and bell teeth are usually not contacted by the zither. The tissue roll in most cases is set about 2/3 away from the teeth tips. This is accomplished by moving the assembly in the slots in the mount bracket.

35.4. Set zither "on" by manually pushing the knob (136).

35.4.1. Adjust tissue contact with comb using the adjustment screws to get the best sound.

35.4.2. Tighten mount screws.

This completes the assembly of the movement.

36. Installing movement in the case (box).

Note: Before installing the movement make sure that the box has been repaired, cleaned, and treated with a good furniture oil.

CAUTION: MAKE CERTAIN THAT THE WOODEN PLATFORM BLOCKS FOR MOUNTING THE MOVEMENT ON BOTH SIDES ARE SECURE AND SOLIDLY ATTACHED TO THE BOX.

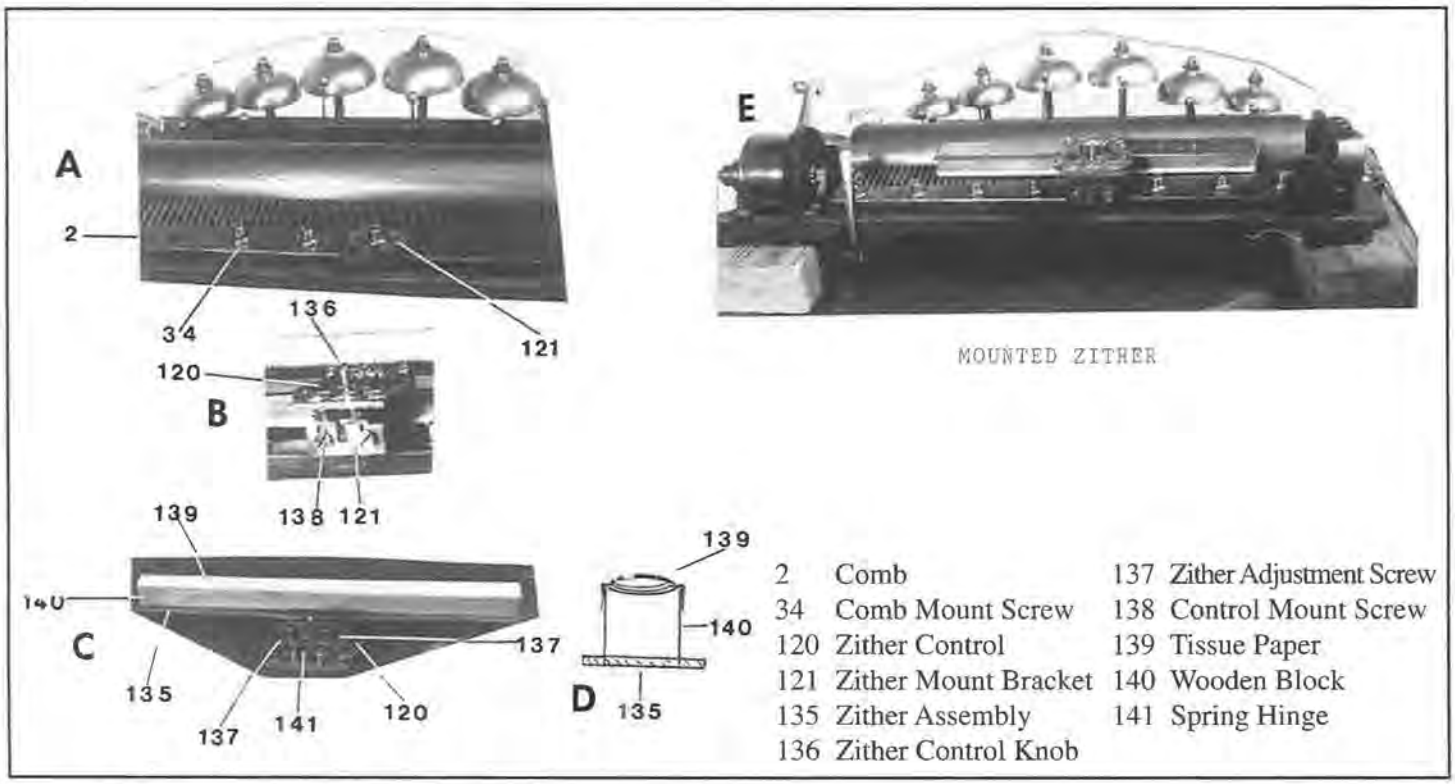


Figure 21.2. Zither assembly components.

36.1. Place movement in position on its blocks.

36.1.1. Insert and tighten the three screws through the bedplate and into the blocks.

Note: This procedure is for the box we are working on, and similar boxes. The earlier music boxes had legs attached to the bedplate instead of the wooden blocks. The movement was attached by four screws. Two went through the front of the box into the bedplate. The other two were similarly mounted through the back of the box.

37. Mount and attach the control panel and controls. (See Figure 21.3 on page 38.)

37.1. Place control panel in position.

37.2. Attach start/stop lever (142) to lip (144) on the stop arm (22).

Note: Screw the start/stop lever securely to its mounting on the panel, since in the "on" position it holds the stop arm (22) in the "run" position against the compression of the stop spring (21). If it slips, the movement will stop at the end of a tune. The control pin (96) will be pushed into the stop notch (98) because of the pressure of the stop spring.

37.3. Attach tune change control lever (143) to the tune change lever (74).

37.4. Re-install wooden partitions (145).

38. Test run the music box through several complete cycles (twelve tunes in our case). Listen for any unusual noises and observe the operation of all components and controls.

38.1. Correct any discrepancies, and re-test until you are satisfied with the operation.

This completes Part 21, and also the series on this music box.

In the next part we will start on an eighteenth century Viennese Picture clock with Grande Sonnerie Strike and a two-tune music box playing upon completion of the hour strike.



TIME FOR ACCURACY

WITSCHI's waterproof tester — the ALC 2000

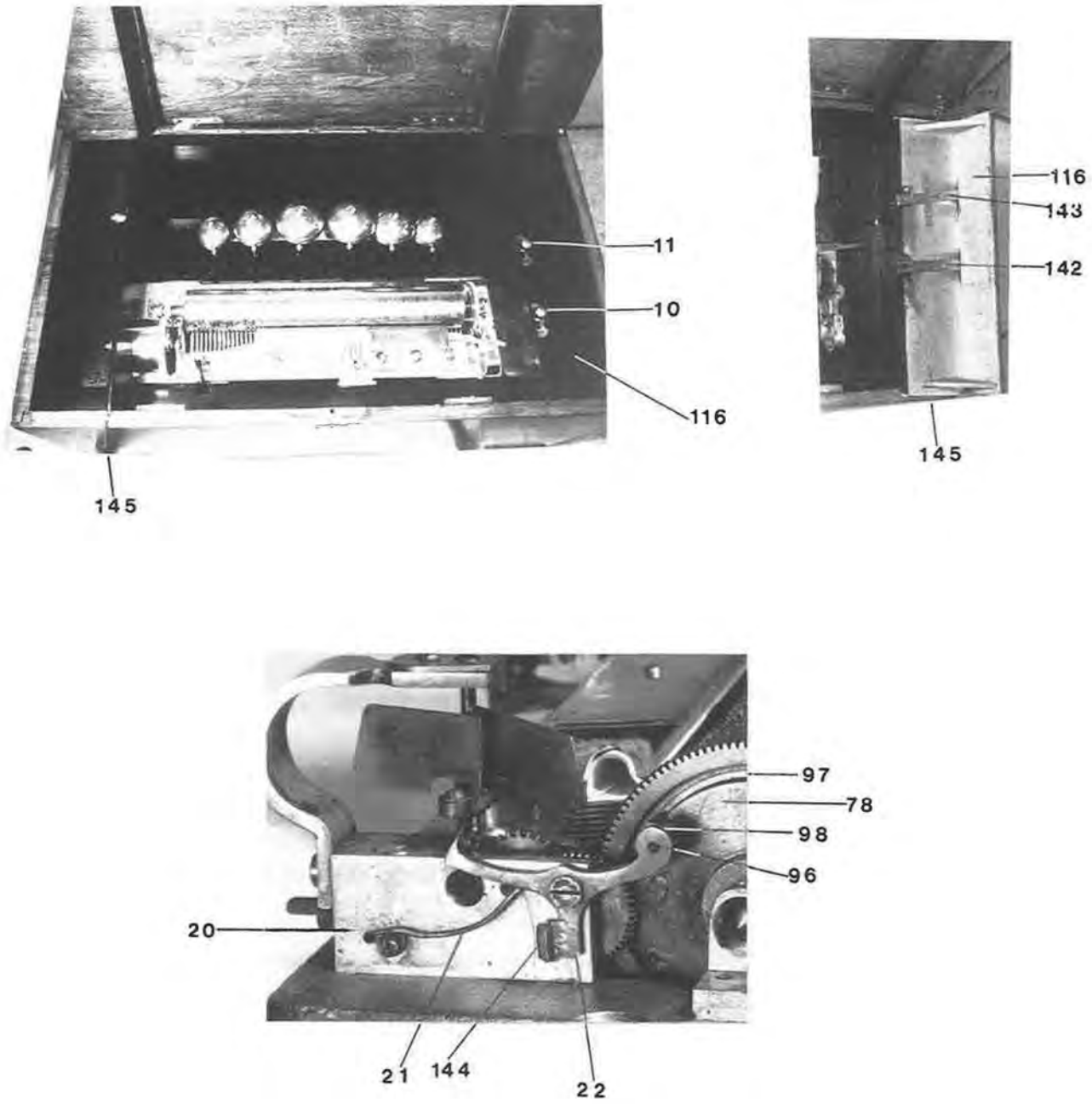
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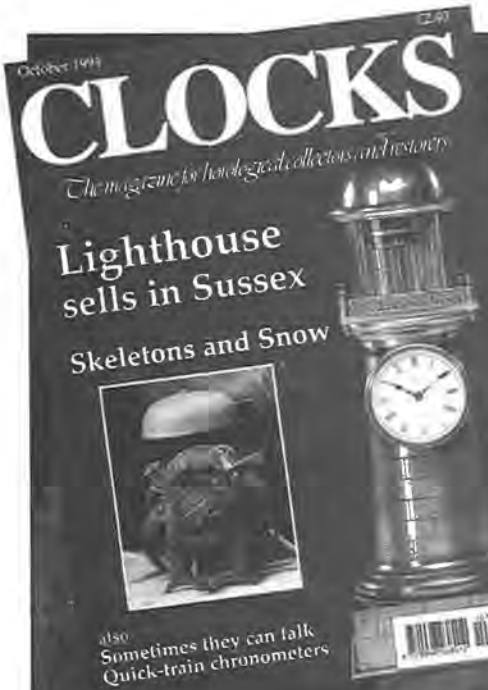


10	Stop/Start Control	78	Cylinder Great Wheel	142	Start/Stop Control Lever
11	Tune Change Control	96	Controller Pin	143	Tune Control Lever
20	Governor Block	97	Control Groove	144	Stop Arm Lip
21	Stop Arm Spring	98	Stop Notch	145	Wooden Partitions
22	Stop Arm	116	Control Panel		

Figure 21.3. Control panel and related components.

AN IMPORTANT MESSAGE FOR WATCHMAKERS AND RETAIL JEWELERS

Within the past few years, there have been numerous voluntary reports from our members—and others—to the effect that various Swiss makers (for the most part, high end) are refusing to provide spare parts for their watches to supply houses and watchmakers. Instead, these makers require that a customer's watch be sent to their own facilities for service. Very often, this turns out to be far more expensive to the customer than if a repair were performed by a qualified watchmaker with whom the customer deals directly. Further, of course, this practice adversely affects the livelihood of such qualified watchmakers. AWI management has earnestly discussed this problem (which seems to be following a pattern among the various makers) with several of these makers, but has met with very limited success. We are therefore now interested in hearing from members, and others, with more detailed accounts of their experiences (and copies of any supporting correspondence which they might have) which demonstrate refusal by specific Swiss makers to provide spare parts. This information should be addressed to the AWI Task Force for Spare Parts, c/o AWI Central.



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INDUSTRY NEWS

Energizer® Unveils New Name

As a sign of the times, Energizer, legally known as Eveready Battery Company, unveiled a new sign that carries the company's new trade name. Energizer CEO, J. Patrick Mulcahy, put finishing touches on the 40-foot sign as it was installed on the company's world headquarters in St. Louis, Missouri.



"We have a strong 100-year heritage as Eveready Battery Company, but the world is changing and our global flagship brand is Energizer," said Mulcahy. Energizer is marketed and sold in more than 160 countries around the world.

The name change showcases the premium, high-tech, long-lasting image enjoyed by Energizer throughout the world. New signs have been installed at company facilities throughout the world. Flashlights, rechargeable round cells and "Super Heavy Duty" batteries will continue to use Eveready in their brand names.

"The strength of our flagship brand, Energizer, casts a halo of quality and leadership on the entire company throughout the world," Mulcahy said. "By calling ourselves 'Energizer,' we will continue to invest in the equity of this important franchise."

Energizer added the strength of its franchise when it introduced the first alkaline on-battery tester in the world. "This represents the most significant advancement in alkaline batteries in decades," Mulcahy said. The tester enables people to test the power of their batteries anytime, anywhere.

Energizer has been part of the St. Louis skyline since 1986 when the company was acquired by Ralston Purina Company. Energizer is the world's largest manufacturer of dry-cell batteries and flashlights and a global leader in providing portable power.

Vibrograf U.S.A. Corp. Introduces the Cyclo Matic Due

Mr. Joseph D. Presti, President of Vibrograf U.S.A. Corp. announced the introduction of a new automatic watch winder for the owner or collector of fine mechanical watches particularly those with calendar or lunar phase dial. The Cyclo Matic Due turns one or two watches automatically every hour. The robust motor is battery driven. Attractively packaged in dark blue polystyrene case.



For further information contact: Mr. Joseph D. Presti, President, Vibrograf U.S.A. Corp., 504 Cherry Lane, Floral Park, NY 11001-1696. Phone: (516) 437-8700.

Low-Cost Jewelry Research Kit Available from Indium Corporation

In order to help jewelry manufacturers and designers reduce cadmium and nickel use, Indium Corporation has introduced a low-cost Jewelry Research Kit.

The kit contains a sample of indium sulfate used in gold-plating baths to harden gold, an indium ingot which can be used for alternative brazing/whitening alloy development, three feet of pure indium, .030" diameter wire and a 6" piece of 1" wide by .002" thick pure indium foil.

Two different fluxes and a pocket flux selector along with an MSDS on indium sulfate and a technical bulletin on indium properties are included in the kit.

To order Jewelry Research Kits or to obtain more information, call 800-4-INDIUM or 315-853-4900.

Founded in 1934, Indium Corporation of America, headquartered in Utica, New York, is the world's largest producer, refiner, fabricator and marketer of indium and indium products and is a leading supplier of specialty solders and alloys.



Mahar & Engstrom Co., Inc. Merges with the Cas-Ker Co.

The material and tool business of Mahar & Engstrom in Quincy, Massachusetts, has been merged with The Cas-Ker Company of Cincinnati, Ohio, as of February 21, 1997. Bob Mahar, principal of Mahar & Engstrom, will join Cas-Ker as a sales representative in the New England states. Mahar, former president of Mahar & Engstrom, is well known in the industry and has served as President and board member of the Jewelry Industry Distributors Association.

All customers will be serviced from Cas-Ker's distribution facility in Cincinnati. Most orders are shipped the same day that they are received. Next-day delivery up to two pounds will be offered for as low as $7.25.

For more information call Bob Mahar or Cas-Ker President, Patrick Cassedy, at 1 (800) 487-0408. Orders may be placed by calling the same number or by faxing 1 (800) 487-5848.

AFFILIATE CHAPTER COLUMN

By Jack Kurdzionak

Last Call

The annual meeting of the delegates and directors of AWI will take place later next month. Your chapter should have already selected a delegate, made his travel arrangements, and assigned him his duties at the annual meeting. In case these things have not occurred, they can still be arranged, but time is of the essence.

1. Appoint a qualified delegate from your chapter to attend the meeting to be held in the Cincinnati, Ohio area on June 27-29. The delegate must be a member of AWI.
2. Make travel arrangements for the delegate. Airline travel to the meeting is convenient for many. Automobile travel is convenient for some. Bus and train travel are optional but probably not the most convenient. AWI will reimburse the delegate for up to $400 of his traveling expenses. Traveling expense payment must be requested, it is not automatically paid to the delegate. The new reimbursement is double what it has been in the past to reflect the greater expense of today's travel. The directors have also added the requirement that the delegate must attend the entire meeting of the delegates and directors to be eligible for the reimbursement.
3. Often overlooked, but very important, is assigning the delegate his responsibilities for the meeting. The delegate's job is to represent the affiliate chapter at the delegates' meeting and to make the voice of his chapter heard at the meeting. The delegate should be familiarized with any issues concerning his chapter. He should also be able to address these issues and others that will come up at the meeting.

We will again have an informal social gathering of the delegates on Thursday evening before the Friday morning annual meeting. The informal meeting has been held for the past three years on the evening before to familiarize the delegates with the procedures at the official meeting while allowing them to meet each other on an informal basis. Many helpful experienced delegates are there to assist new delegates in understanding procedural matters for the Friday meeting. This has been very helpful to streamline the delegates' meeting, allowing them to get on with their business with a minimum of unnecessary delay.

The affiliate chapter delegates can make any constitutionally allowed proposal to the other delegates. If the proposal meets with approval of the majority of the delegates the chairman will present that proposal to the directors at their annual meeting which takes place after the delegates' meeting. A favorable vote of the directors present will make that proposal the policy of AWI. It's as easy as that.

Some delegates choose to come only for the Friday meeting and then go right back to the bench for Saturday. This is shortchanging your chapter in two ways. The chapter will not be eligible for travel assistance and the delegate will not have a broad grasp of the issues involved at the complete meeting. The AWI meeting begins on Friday and continues through Sunday and concludes with the final directors' meeting. The delegate who attends all of the meetings as well as the president's dinner on Saturday evening will be doing justice to his assignment. He will arrive at the meeting with a small cache of knowledge about the workings of AWI and will leave on Sunday with a wealth of information to share with the folks back home in the local chapter.

Even if your chapter does not have any burning issues in mind for the annual meeting, it is imperative that your chapter is represented. If you send no one, the issues will be decided by the delegates who do attend. Your chapter has paid its dues and your members have paid theirs, you cannot afford not to be represented at the meeting.



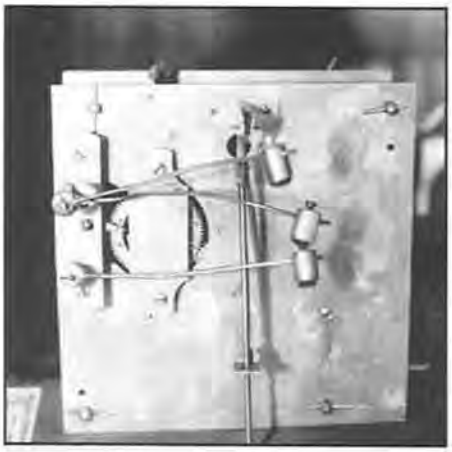
BULLETIN BOARD

A. NEW REQUESTS

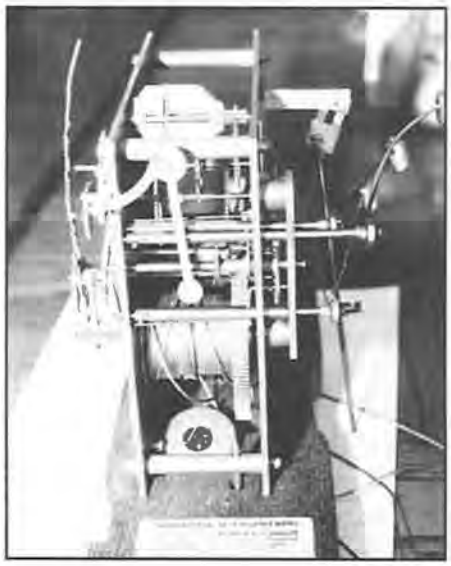
Antique German Clock with Two Weights

Kenneth B. Clements, Hendersonville, TN, has an antique German tall clock with two weights but three striking strings. It strikes the quarter-hour and then switches to another "set" to strike the hour. The problem is that something is missing that keeps the mechanism engaged with the hour-strike set. He asks, "can one of your experienced readers tell or guess what is missing?" On the back of the movement are the markings:

D.R.P.
No 54033
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Early Rolex

Mr. John B. Lyons, Mt. Airy, MD, sends the following request:

Enclosed please find several photographs of an early Rolex 11.5 line. Please excuse the dark prints. This is what I know/believe to be true of this watch which may not be self-evident.

The case number is 1416983591. The number is stamped on the back cover. It is an early Rolex product, approximately 1925. It appears to be an AS caliber made prior to ETA's purchase of AS.

The dial says Automatic Winding in a semi-circle with Athlete between the two words. Antimagnetic is in a semi-circle over the seconds bit. M is stamped at the pallet. Robot Watch Co. is lightly scratched on the movement and case.

Mr. James Dowling, in England, knows of only four others in existence and believes it is a second division watch. (i.e., Tudor type). I have searched all the fingerprint material I have and cannot further identify the movement.

Can anyone provide me with the following information? Who is the manufacturer? Is it possible to obtain a fourth wheel pinion? (Is there a reasonable chance that a pinion from another caliber could be substituted?) Who would you recommend that could make a fourth wheel pinion? Do you know of any major Rolex collectors who may have additional information?









Prentice Standard Calendar Clock
David L. Adams, Pittsfield, NH, has a Prentice Calendar clock like the one illustrated here. Can a reader supply a copy of the instruction booklet that came with the clock? Would someone send a drawing of the correct bends of the wires holding the date cards?



B. RESPONSES

No answers were received to last month's "Bulletin Board" requests.

C. ITEMS STILL NEEDED

Winding Coils for Accutrons
A member in Austin, TX, is attempting to develop a method to wind coils for Accutron watches. He is searching for a source for the wire and needs the recommendation of a solvent which will dissolve the coating on the old coils.

Enameled Dials, Repair and Reproduction
AWI is frequently asked for sources to have enameled watch and clock dials repaired or reproduced completely. There are a couple of sources in England that we are aware of; we would like to locate something in the United States.

Portescap Mark V Cleaner
John Weigel, Antelope, CA, is seeking a schematic and operator's manual for the Portescap Mark V cleaner. We have Portescap VC-10 on file, but nothing for the Mark V. We will copy your manual and return the original to you.

Staff/Stem Conversion Charts: Bestfit to Quickfit
Louie Burwinkel, Dry Ridge, OH, is seeking reference charts that will allow him to convert Bestfit system staff and stem numbers to Quickfit system numbers.

Twaites and Reed Inclined Plane Clock
Ray Clauss, Delray Beach, FL, seeks disassembly information for an Inclined Plane Clock manufactured by Twaites and Reed (England) in 1974. The clock was retailed in the U.S. by the Franklin Mint.

Jaeger LeCoultre Aircraft/Tank Clock
Louis Delouise, Nenana, AK, is seeking an exploded view of a Jaeger LeCoultre aircraft clock or tank clock. One is type 165R, the other has serial number M20.

French Mantel Clock
Danny Hooper, Bowmanville, Ontario, Canada, seeks information on the setup of a French clock identified by the symbol below.

He is looking for any information a reader can provide regarding the escapement, calendar mechanism (days/date/month), and the dial.



Girrard Perregaux Ebauche Information for Later Models
IJS, Indianapolis, IN, is seeking a chart giving the Swiss ebauche for the more recent Girrard Perregaux calibers; calibers released since the *Best-Fit* book was published.

Junghans Spare Parts and Photo
Stephen Gergely, Moncton NB, Canada, seeks spare parts information and/or a photo, sketch, or drawing of Junghans caliber D09, an old Westminster movement. Any information you can provide will be appreciated.

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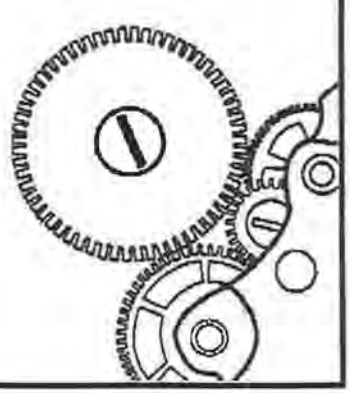
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ANSWER

To remove enamel from the case, first make sure there is no steel on it. Heat the case carefully but not enough to melt the solder. Then, plunge it into cold water. Repeat this a few times. The sudden change in temperature will crack much of the enamel away from the metal.

The remaining enamel may be dissolved by the use of hydrofluoric acid. This acid is kept in wax, lead or plastic containers. It may not be kept in glass bottles as the glass would dissolve. When you buy a small container of this acid, ask the chemical firm for a plastic container, somewhat wider than your case, that will not be affected by the acid. Carefully pour some hydrofluoric acid into this container to a depth of about three quarters of an inch.

Hook a piece of gold wire to the case and carefully immerse it in the acid. Allow the free end of the wire to protrude well above the acid. After about fifteen minutes, carefully remove the case by means of the gold wire and rinse it well. Examine if for enamel. If the enamel was not entirely removed, repeat the process. Do not leave the case in the acid any longer than necessary as the gold itself may be slowly attacked.

When finished, slowly pour the acid back into its container, close it well, and store it in a very safe place. Keep acid away from tools as the fumes will rust steel. Remember to use extreme caution when handling this acid. It is dangerous, extremely corrosive and capable of giving a nasty burn.

QUESTION

We have an old silver hunting case watch. It has "T. F. Cooper, London—patent lever—full jeweled" on the inside back lid. The case number is 6123 AP. It is a key-wind, key-set model.

The train has separate bridges. No name or numbers appear on the movement. Can you tell me anything about its age and maker?

L.J., Farmington, Illinois

ANSWER

I've examined a number of T. F. Cooper watches, many like yours.

T. F. Cooper of Greys Inn Rd., London, also had operating centers in Liverpool. His watches date from about 1835 to 1870.

The description indicates yours was made around 1845. These were sturdily built, and many were exported to the United States.

Cooper also imported watches from Switzerland. Yours, with the separated bridges, could be Swiss. The English seldom made such "Lepine" calibers with separate bridges at that time.

Henry B. Fried

QUESTION

Who first used engine turning as a means of decoration of watch cases, etc. and was it in the U.S. or Europe?

F.G.T., San Jose, California

ANSWER

Credit for the invention of engine turning must be given to the Swiss. The cutting at first was deeper and much coarser than the beautiful work seen later. Breguet, the famous French artist and craftsman, greatly improved upon the early Swiss work.

Henry B. Fried

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3	3.0	11	0.50	1.30	9	3.5	11	0.65	1.30
4	3.0	12	0.50	1.30	10	3.5	12	0.65	1.30
5	3.0	10	1.25	1.30	11	4.0	10	0.65	1.70
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2	3.0	1.50	13	Flush	1.60	20	3.5	1.60	11	+ 1.00	1.60
3	3.0	1.60	10	- 0.10	1.60	21	3.5	1.60	12	+ 1.00	1.60
4	3.0	1.60	11	- 0.10	1.60	22	3.5	1.80	10	Flush	1.95
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6-8	Repair of the Bulova Accutron★ Henry Frystak	Tucson, AZ $162.00
7-8	Organize Your Work Habits for Success★ Robert Ockenden	Tucson, AZ $100.00
JULY 1997		
12-13	Advanced Pocket Watches Alice B. Carpenter	Orange County, CA $100.00
19-20	Repair of the Atmos Clock Gerald G. Jaeger	Grand Junction, CO $100.00
26-27	400-Day Clock Repair Ron Iverson	Dallas, TX $100.00
AUGUST 1997		
15	Introduction to Watch/Clockmakers Lathe★ Roy Hovey	Austin, TX $62.00
16-17	Hairspring Vibrating Joseph L. Cerullo	Orange County, CA $100.00
23-24	Repair of the Atmos Clock Gerald G. Jaeger	Winsor, Ontario $100.00
SEPTEMBER 1997		
5-7	Repair of the Bulova Accutron★ Henry Frystak	Johnstown, PA $162.00
12-15	Phase IV-B - Wheel Cutting Operations for the Watch/Clockmaker - Roy Hovey	Charlotte, NC $380.00
19-20	Hairspring Vibrating★ James E. Lubic	Effingham, IL $100.00
20-21	Repair of the Atmos Clock Gerald G. Jaeger	San Jose, CA $100.00
25-26	Basic Lathe Operations★ Roy Hovey	Ocala, FL $112.00
27-28	Hairspring Vibrating Joseph L. Cerullo	Grand Junction, CO $100.00
OCTOBER 1997		
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19-20	Micro Milling (Rack & Snail)★ Roy Hovey	Eagan, MN $125.00
NOVEMBER 1997		
7-10	Phase I - Lathe Program Roy Hovey	Orange County, CA $290.00
15-16	Repair of the Atmos Clock Gerald G. Jaeger	Phoenix, AZ $100.00
JANUARY 1998		
23-26	Phase II - Lathe Program Roy Hovey	Orange County, CA $200.00
FEBRUARY 1998		
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29-Oct. 3	Clock Escapements Jerry Faier	$250.00
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