MAY 1988

HOROLOGICAL TIMES™

Watchmakers, Clockmakers and Allied Craftsmen

The Jewelry Industry's Most Compact and Efficient Leather Strap Book Merchandiser will help you show and sell Men's and Women's Watch Straps!

Extra Profits

2.6 Keystone

40 Packages Straps of best selling **Remborde'** styles, in most popular prices and sizes.

The **easiest-to-use Over-the-Counter** presentation!

Closed: 6-1/2 x 12" x 2-3/4" **Men's Book:** Bk-525 — All Men's Styles.

Open: 3-1/2" x 12" x 5/8" **Women's Book:** BK-485 — All Women's Styles.

Your Net Cost BK525 $264 BK485 $264 TERMS AVAILABLE

Waterproof Skindiver and Sportstraps™ Suggested Retail $2.95 Each.

K-35 Men's Sportstrap (Casio-type); Black. 11/16" (18mm)

K-353 Men's Sportstrap (Casio-type); Black. 13/16" (20mm)

K-351 Men's Sportstrap (Casio-type); Black. 3/4" (19mm)

K-354 Men's Sportstrap (Casio-type); Black. 13/16" 20mm)

K-352 Men's Sportstrap (Casio-type); Black. 11/16" (18mm)

K-355 Men's Sportstrap (Casio-type); Black. 3/4" (19mm)

Esslinger & Co.

P.O. BOX 64561 ST. PAUL, MN 55164
National WATS - Orders Only 800-328-0205
Minnesota WATS - Orders Only 800-392-0334
Inquiries - Information 612-452-7180

VOLUME 12, NUMBER 5 MAY 1988

HOROLOGICAL TIMES™

Official Publication of the American Watchmakers Institute

HOROLOGICAL TIMES (ISSNO145-9546) is published monthly and copyrighted by the American Watchmakers Institute, 3700 Harrrison Avenue, Cincinnati, Ohio 45211, for $40.00 per year ($4.50 per copy in the United States and $50.00 per year; $5.50 per copy outside the U.S.). Second class postage paid at Cincinnati, Ohio. POSTMASTER: Send address changes to HOROLOGICAL TIMES, P.O. Box 11011, Cincinnati, Ohio 45211.

24

Refinishing Antique Clock Cabinets

36

JIDA and AJMA Recap

40

DEPARTMENTS

HOROLOGICAL TIMES™

EXECUTIVE AND EDITORIAL OFFICES

AWI Central
P.O. Box 11011
3700 Harrison Avenue
Cincinnati, Ohio 45211
Telephone: (513) 661-3838

Milton C. Stevens: *Interim Editor*
Michael P. Danner: *Interim Editor*
Regina Stenger: *Associate Editor*
Harold J. Herman: *Senior Technical Editor*
Donna Baas: *Production Director*

Nancy Wellmann: *Business Manager*
Mildred Howard: *Circulation Manager*
Margie M. Brater: *Circulation*

TECHNICAL EDITORS:

James Adams
William Biederman
James H. Broughton
Fred S. Burckhardt
Edgar "Nick" Cleves
Steven G. Conover
Joe Crooks
Wes Door
Henry B. Fried
Ewell D. Hartman
Robert A. Nelson
Archie B. Perkins
Marshall F. Richmond
Marvin E. Whitney

AWI OFFICERS:

William Biederman, CMW: *President*
Robert F. Bishop, CEWS: *1st V. President*
Alice B. Carpenter, CMW, CEWS: *2nd V. President*
Wes Door, CMW: *Secretary*
Marvin E. Whitney, CMW, CMC, FAWI: *Treasurer*

AWI DIRECTORS:

James H. Broughton, CEWS
Fred S. Burckhardt
Buddy Carpenter, CMW, CEWS
Henry Frystak, CMW
Ewell D. Hartman, CMW
Gerald G. Jaeger, CMW, CEWS
Ben Matz, CMW
Robert A. Nelson, CMW, CEWS
Archie B. Perkins, CMW
Marshall F. Richmond, CMW

Thomas H. White: *Affiliate Chapter Director*
Dwight Tubb: *Research and Education Council Director (REC)*
Fred S. Burckhardt: *Past President*

Milton C. Stevens, FAWI: *Executive Secretary*
Michael P. Danner: *Administrative Director*

*** FELLOWS ***
OF THE AMERICAN
WATCHMAKERS INSTITUTE

George Daniels
Henry B. Fried
Josephine F. Hagans
Orville R. Hagans
Hamilton E. Pease
Milton C. Stevens
Marvin E. Whitney

UP FRONT

ANNUAL MEETINGS IN JUNE

Next month AWI will be conducting its annual meetings. This will involve the annual Board of Directors Meeting, June 25 and 26; the Affiliate Chapter Delegates Meeting, June 24; ELM Trust Trustee Meeting, June 23; and the REC In-Service for Instructors, June 21-23. All of these meetings will be held at the Drawbridge Inn & Convention Center, I-75 at Buttermilk Pike, Ft. Mitchell, Kentucky (near the Greater Cincinnati International Airport).

It is true that these are meetings with many reports to be considered, and much work to be done, and they should not be confused with a convention. However, members who would like to attend the Chapter Delegates Meeting and the annual Board of Directors Meeting are welcome and encouraged to do so. To do so will provide you with the opportunity to meet and chat with many of the leaders in the industry, and to gain a better understanding of the over-all AWI operation. If you plan to attend, drop AWI Central an advance note so we can send you an agenda of events.

SERVICE FEE POLICY

Since the first of the year the AWI service fee policy has been in effect. The policy was established by the Directors as an alternative to raising dues as a means to pay for the increased costs of providing technical services. The directors provided each member with a card which entitles them to twelve service requests without payment of any fee. Members requiring more than twelve inquiries during the year are asked to share the cost of providing this service by paying $2.00 for each additional request—a small price to pay when the cost of receiving, processing, and answering a piece of mail in today's business world costs in excess of $2.50 per communication. This of course does not include time spent on library searches or photocopying pages of information.

98.5% of our members understand the policy and are cooperating completely. They send their cards in with their requests and since their requests require no special handling or lengthy explanations, it's no secret why those requests are given priority handling.

Then there are those in the 1.5% who: lost their card or threw it away; paid their dues and insist on service without the card; try to beat the system; legitimately failed to read about and become familiar with the system. These people do cause special attention and additional work on the part of an already overtaxed staff. Therefore, their requests are necessarily handled on a delayed basis.

To insure prompt handling of your service requests, always include your card with your mail request. For those not yet familiar with the card, it is reproduced on page 13. Your card was included with your 1988 Membership Renewal Mailing which also included your membership card, decal, certificate, etc. It was mailed in a 9½"x12½" inch envelope. If you haven't already found it, look for the card in your renewal packet.

OFFICE HOURS

The business hours of AWI Central are Monday through Friday, 8:00 AM to 4:00 PM Eastern Daylight Time. AWI Central closes on all national holidays. AWI Hotline (513) 661-4636 is operating 24 hours (recording).

ON THE FRONT: AWI Member Hans Gerdes, a resident of Stanton, California, sent us this photograph of Poppies—the State Flower of California. Here they are in all their glory, just in time for Spring.

POWER SELL

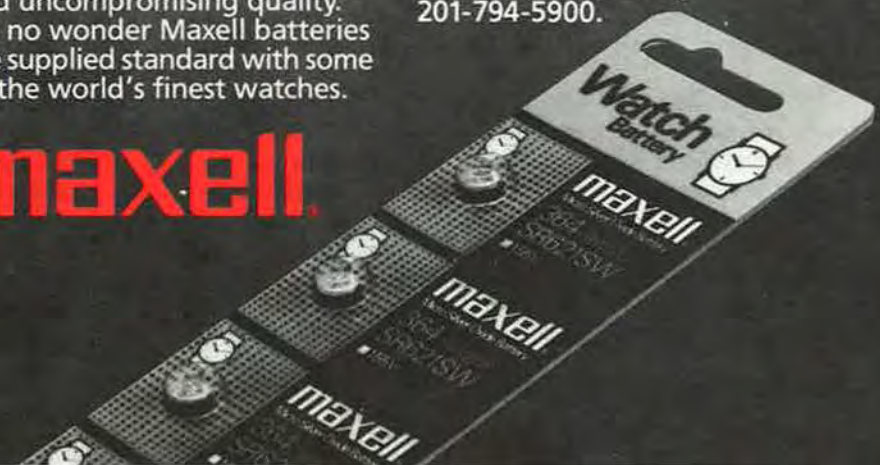
Power profits.
If you thought one watch battery was the same as another, think again. Maxell batteries make a difference where it counts most—your bottom line. With attractive margins and consistent quality to satisfy both you and your customers.

Power packaging.
Maxell watch batteries are packaged expressly for your business, in convenient, perforated blister-card strips. They're color coded for type and size. And cross-referenced for instant identification.

Power personality.
Your customer is pre-sold on the Maxell name as the standard-bearer for advanced technology and uncompromising quality. It's no wonder Maxell batteries are supplied standard with some of the world's finest watches.

So when it's time to stock up on power cells, go for the Power Sell. Maxell Watch Batteries. Call your Maxell distributor for more details, or contact Maxell Corporation of America, 22-08 Route 208, Fair Lawn, NJ 07410; 201-794-5900.

maxell



President's Message

William Biederman

"Bulletin Board" Policy

It has been nine months since the "Bulletin Board" column was introduced in the *Horological Times*. In this brief period it has become a valuable and useful tool in helping us to serve AWI members better. The purpose of the "Bulletin Board" is to seek sources, information, or techniques for which we have inadequate—or often no—information in our technical files.

The requests for information that we list are frequently items that have been sought unsuccessfully in the past. Other times we may be seeking to broaden the base of information we presently have in file. At no time do we list individual requests for a part or parts that, in our opinion, might be obtained by contacting conventional suppliers, or placing an ad in the Classified Ad Section of the HT. Several times we have received lists of eight or nine parts an individual happens to be looking for. It is not the purpose of the "Bulletin Board" to publish such lists.

We have received about a dozen letters asking why, when we note we have found answers to a previous request and list them in section "B" of the column, we do not publish the information we have gathered. It stands to reason that if a dozen readers felt compelled to write and ask this question, there must be several dozen more who have wondered and just never bothered to write. There are several factors involved here.

Often a person will offer to help an individual on a one-to-one basis. This frequently happens when an unusual piece of material is needed. A reader will contact us and say, "I have a couple of those and can help this member out." In this case the "Good Samaritan" does not want to be flooded by requests from others needing the same thing, because he simply cannot provide it. Others will, on occasion, ask us to screen requests and if, in our opinion and having knowledge of the limited supply, think he may be in a position to help an individual, permits us to make a referral. This happened recently with a member who was willing to help out with a few of the older Gruen movements he had on hand.

For some requests we develop several pages of information about one topic. Considering the cost of publishing just one page in *Horological Times* it is foolish to reproduce this information on the chance that a handful of readers just might be in need of it at the time. There just isn't enough reader interest in an isolated item to warrant this kind of expense. Especially so when the information will be provided for sending the request along with a self-addressed, stamped, business-size envelope to the "Bulletin Board."

In order to be practical and keep costs down, we only provide information involving single requests. We will not send complete lists of data, month after month, to individuals who are obviously building up their own private resource file. We are sorry if that offends some, but, our modest dues structure and "bare bones" office staff does not permit us to provide this kind of service. We offer to make the information available when you need and request it. We believe this is a fair and reasonable policy. Most of our members understand and are benefitting from the column and are using it in the manner for which it was established.

It is especially gratifying to note the number of individuals who have come to the rescue and provided information for a member's request. We have some readers who read the column every month for the sole purpose of lending help when they can. Others take time from their busy day to respond to a request for which they have specific knowledge or interest. It is this kind of cooperation that makes the "Bulletin Board" a success, and truly exemplifies the AWI motto: "AWI is horologists helping horologists." I feel privileged to have the opportunity to serve as President of an association that displays this spirit of cooperation and fraternalism.

A TIMESAVING CHART FOR SEIKO STEMS

By James Broughton

In my shop I try to save as much time as possible, even to the smallest detail. Because we are frequently called upon to replace a Seiko stem, I keep the chart below close at hand. Because I use it so often, I have the chart covered in a plastic page holder, the type you can buy at any stationary counter. I also have the chart saved on a computer disk so that I can quickly alter or add to it, or make a new copy when necessary. This chart, of course, does not contain all Seiko calibre numbers. I purposely included only those calibres that I frequently use; you will want to use any others that are on your "frequent use" list.

The timesaving feature results from having the Seiko calibre numbers listed in numerical order. When I need a stem, I grab the chart rather than go to the bother of using the microfiche. Now I don't mean to downplay the importance of the microfiche system; it's a real help in the shop. But, for items used as frequently as Seiko stems, this chart close at hand saves me time.

To either select or order a Seiko stem, I look at the chart's calibre number column. When the calibre number is located I can quickly determine the bottle number I need to complete the task. If I am ordering that stem, I look to the final two columns on the chart, find the bottle number, and order the corresponding stem number displayed in the last column. For example, if I have a Seiko calibre 6106 needing a stem, I grab my chart and look down the calibre number column to 6106. This tells me that the stem is to be found in bottle #42. If I want to order the stem, I proceed to the last two columns listing bottle numbers, find bottle 42, which tells me to order stem #354615. All of this happens in less time than it took you to read the explanation.

When changes are needed in the chart, I put the disk into the disk drive unit of my computer, complete the changes, and print out a new copy of the chart. I am glad to be able to share this chart with you. Feel free to copy it and use it as you see fit. Guilds may want to reproduce it in their newsletters for their members' use; you have my permission. Please note that this is not a complete list but just those stems I have in stock.

BOTTLE NUMBER	MODEL	BOTTLE NUMBER	MODEL	BOTTLE NUMBER	MODEL	BOTTLE NUMBER	MODEL	BOTTLE NUMBER	STEM NUMBER	BOTTLE NUMBER	STEM NUMBER
53	0532	34	6206	19	8122A	19	5Y00A	25	351105	30	354560
37	0903A	49	6217	19	8123A	19	5Y01A	01	351110	16	354576
01	1100A	17	6300A	21	8221A	19	5Y02A	02	351130	31	354588
01	1104A	17	6302A	21	8222A	19	5Y13A	26	351134	17	354601
01	1120A	17	6306A	21	8223A	19	Y100A	03	351142	42	354615
01	1140A	17	6308A	21	8241A	19	Y101A	04	351152	32	354616
01	1144A	17	6309A	21	8242A	19	Y102A	05	351205	33	354692
02	1320A	17	6319A	21	8243A	19	Y106A	27	351208	18	354705
03	1400A-B-C	17	6347A	51	8305	19	Y107A	06	351221	34	354720
04	1520B	17	6349A	10	8610A	19	Y108A	07	351225	35	354728
38MALE	1700-17A	19	6530A	11	9721A	19	Y112A-B	08	351307	36	354735
39POST	1700-17A	19	6531A	11	9722A	20	Y121A	09	351480	52	354753
06	2201A	19	6532A-B	11	9723A	20	Y130A	10	351486	19	354765
06	2202A	19	6533A	06	98390	20	Y131A	43	351663	46	354780
06	2205A	19	6539A	28	2A23	22	Y142A-B	44	354015	20	354786
06	2220A	33	6601	35	7A38A	22	Y143A	48	354025	40	354805
45	2622	43	6602	25	5A23A	22	Y145A	53	354048	21	354825
14	2821A	12	6922A	07	2C20A	22	Y147A-B	11	354055	51	354849
40	4006A	12	6923A	07	2C21A	01	Y431	28	354073	22	354866
41ALARM	4006A	48	7001	05	2E20A	03	Y432A-B	12	354076	37	354900
31	4110	44	7005	05	2E50A	02	Y434A	13	354230	23	354902
18	5420A	44	7006	07	2G28A	09	Y480A-B	14	354235	49	357500
18	5421A	11	7121A	07	2G38A	10	Y481A-B-C	29	354236	47	357611
30	5606A	11	7122A	07	2G78A	10	Y482A-C	45	354260	24	357612
30	5626	11	7123A	07	2G98A	17	Y504A	15	354340	38	372170
17	5780A	11	7143A	08	H448A	17	Y512A	50	354421	39	373250
30	5919	36	7320A	08	H449A	17	Y513A-B-C	50	354423	41	8999984
42	6102	12	7424A	19	V102A	16	Y561A				
42	6105	12	7432A	19	V103A	16	Y562A				
42	6106	12	7433A	27	V220	16	Y563A				
24	6106B-C	12	7434A	05	V220A	16	Y572A				
42	6109	12	7439A	13	V230A-B	16	Y573A				
42	6117	12	7454A	29	V231	23	Y580A				
47	6117	17	7545A	14	V231A	23	Y588A				
42	6118	17	7546A	26	V232	18	Y590A				
42	6119A	52	7559	26	V233	18	Y591A				
24	6119B-C	50	7606	13	V235A	15	Y642A				
32	6138	50	7625	14	V236A	15	Y643A				
24	6139A-B	46	7800	12	V403A						
42	6146	19	8121A	12	V4054A						

Questions & Answers

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

Seiko 8123A Plastic Pillar Plates

Q The horologists in Indiana have come up with another question for you—this time concerning how to handle the plastic pillar plates in the Seiko 8123A.

Even brief immersion in commercial ultrasonic cleaning solution at low and no heat causes the plastic plates to deform radically. These movements are very popular and are regular candidates for overhaul (due to their case construction) yet conventional methods do not work.

Is this a case in which hand scrubbing and pegging with benzene is in order? Or dry cleaning? What does the factory service facilities recommend? Or your own experience?

I know our readers will be quite interested in your response.

David A. Christianson
Kendallville, IN

A *In regard to your inquiry concerning the deformation of a Seiko quartz movement with plastic plates that lost its original contour due to heat. I have contacted our mutual friend Scott Chou, head technician at Seiko's USA headquarters, and I will reflect his remarks here.*

Many manufacturers use plastics in their quartz calibres today. These plastics deform with heat. Ultrasonics behave in a way somewhat like that of a microwave oven. In ultrasonics, though, it is the cavitation that sets up an internal friction of the plastics' molecules as well as those of the surrounding liquids, causing the deforming heat.

According to Scott Chou, some watches with plastic plates will deform when temperatures reach between 120°F and 140°F. Seiko movements, I am informed, will withstand heat up to 140°F before deformation sets in and loses its precise, original contour. Cheaper watches will start deforming at lower temperatures.

Mr. Chou told me that those who insist on using ultrasonics should adjust the cleaning cycle to just under one minute and less (120°F) and to cut down the heat in the last drying cycle. What to do with the "montre mort" (dead movement) that looks like Salvatore Dali's limp watch hanging over an equally dead limb in his famous painting, "The Persistence of Memory"? Send it back to Seiko with the hope they'll give you some credit towards a new one.

About ultrasonics, when I was writing about ultrasonics and doing some preparation for a seven-part article on it in 1957, I visited the Bendix Aviation Co. in New Jersey. To impress me how efficient and powerful ultrasonics were (in cleaning rotary aircraft engines) they threw a big rat into the tub and turned on the power. In a short time that creature was disintegrated—disappeared. Of course, watchmakers' ultrasonics won't do that to your pets but I include this to point out that ultrasonics IS powerful; even in a small way.

Q I am doing some research into quartz silica glass rod as used for compensating pendulums of regulator clocks. I own a regulator clock made in Wien (Austria). The original pendulum of the clock was made of quartz, patent of Ingineur Karl Satori, Vienna.

Could you possibly give me the name and address of the present day factory manufacturing quartz rod, 19mm diameter and 115 cm in length, either in the USA, Germany or England.

Do you know of any clocks incorporating a quartz pendulum rod for compensation?

To the best of my knowledge, this material has the lowest coefficient of expansion for temperature change.

D.H. Brereton
New South Wales, Australia

(Please turn to page 8)

Borel

Quartz Stem Assortment

Borel

for ESA • Seiko • Pulsar • Lorus • Morioka Tokei Citizen • Miyota • FE • Harley • Ronda

Genuine Stems for Quartz Movement Calibers

The Borel assortment of genuine stems is set up in a flexible envelope system. Envelopes are properly marked with stem numbers. It's easy to add new numbers to the system. Included is a chart listing popular movement calibers and the proper stem number to use.

96 piece Quartz Stem Assortment

Covers over 170 calibers.

The 405/96 stem assortment contains 3 each of 32 of the most popular numbers to fit all the calibers listed below. A total of 96 pieces, a value of $160 if bought separately.

#405/96 Stem Assortment **$75**

V102	Y434	Seiko 6923
V103	Y480	Seiko 7424
V220	Y480B	Seiko 7432
V230	Y481	Seiko 7433
V230B	Y481B	Seiko 7434
V231	Y481C	Seiko 7439
V232	Y482	Seiko 7454
V233	Y580	Seiko 8121
V234	Y588	Seiko 8122
V235	Y590	Seiko 8123
V236	Y591	Seiko 8610A
V237		
V238	Seiko 1100	
V239	Seiko 1104	ESA 102.001
V403	Seiko 1120	ESA 202.001
Y100	Seiko 1140	ESA 280.001
Y101	Seiko 1144	ESA 301.001
Y102	Seiko 1320	ESA 301.002
Y106	Seiko 2B21	ESA 361.001
Y107	Seiko 2E20	ESA 555.111
Y108	Seiko 2E50	ESA 555.112
Y112	Seiko 5420	ESA 555.115
Y113	Seiko 5421	ESA 555.121
Y121	Seiko 5Y00	ESA 555.122
Y130	Seiko 5Y01	ESA 555.125
Y131	Seiko 5Y02	ESA 555.411
Y142	Seiko 5Y13	ESA 555.412
Y142B	Seiko 6530	ESA 555.415
Y143	Seiko 6531	ESA 555.421
Y145	Seiko 6532	ESA 555.422
Y147	Seiko 6533	ESA 555.425
Y148	Seiko 6539	ESA 556.031
Y431	Seiko 6922	ESA 556.111

60 piece Quartz Stem Assortment

The 405/60 includes 3 pieces each of 20 numbers – a total of 60 pieces to fit many of the calibers listed below. A value of $100 if purchased separately.

#405/60 Stem Assortment **$46**

ESA 556.112	ESA 956.101	Miyota 3N20
ESA 556.115	ESA 956.102	Miyota 2950
ESA 556.121	ESA 956.111	Miyota 2Y50
ESA 556.415	ESA 956.112	Miyota 2Y51
ESA 561.001	ESA 956.121	Miyota 2N50
ESA 561.101	ESA 956.401	
ESA 578.001	ESA 956.411	Adec 2028
ESA 578.002	ESA 956.412	Adec 2038
ESA 579.001	ESA 956.421	Adec 2958
ESA 579.101	ESA 956.431	Adec 3228
ESA 588.001	ESA 956.101	Adec 2028
ESA 927.001	ESA 961.001	
ESA 927.002	ESA 961.101	Bul 2035
ESA 927.101	ESA 976.001	Bul 2690
ESA 927.102	ESA 977.001	Bul 2692
ESA 927.401	ESA 978.001	Bul 2710
ESA 927.601	ESA 978.002	Bul 2720
ESA 955.031		Bul 2810
ESA 955.101	Cit 2020A	Bul 2910
ESA 955.111	Cit 2030A	Bul 2840
ESA 955.112	Cit 2100A	Bul 2841
ESA 955.121	Cit 2110A	Bul 2852
ESA 955.122	Cit 2140A	Bul 2883
ESA 955.132	Cit 2200	Bul 2892
ESA 955.401	Cit 2250A	Bul 2962
ESA 955.411	Cit 2950A	Bul 2963
ESA 955.412	Cit 2951A	Bul 2971
ESA 956.422	Cit 3220A	
ESA 956.431		FE 6320
ESA 956.432	Miyota 2020	FE 6820
ESA 956.031	Miyota 2030	
ESA 956.032	Miyota 2035	HQ 672
ESA 956.042	Miyota 3220	HQ 3572

Borel

Jules Borel & Company, 1110 Grand Avenue, Kansas City, MO 64106
National Order Desk – 1-800-333-4646
Borel & Frei, 712 South Olive, Los Angeles, CA 90014
National Order Desk – 1-800-654-9591
Otto Frei – Jules Borel, P.O. Box 796, Oakland, CA 94604
National Order Desk – 1-800-772-3456

Borel

QUESTIONS & ANSWERS
(Continued from page 6)

A I have inquired from Mr. Myron Pleasure, whom I consider the best expert on pendulums east of Moscow, about your question.

Mr. Pleasure informs me that it is impossible to obtain a quartz rod made anywhere. It seems that the demand doesn't warrant the effort or expense. He also asserted that the quartz does not compare with the Invar for temperature control. He assured me that the Invar was far superior and certainly more durable.

Mr. Pleasure is constantly in communication with other people who prize precision pendulum clocks the world over and certainly is aware of all the literature and current developments among those who still experiment with them.

Q Having been a watchmaker and jeweler full time since 1941, I have seen a lot of old watchmaking and jewelry repair tools.

Recently I purchased a box of leftover odds and ends from a jeweler's estate. I cannot identify one of the tools. The turned pieces that fit in the handle are brass and come apart in the center. The center of these pieces are hollow. On one end of each is a number; I assume it designates size. There are the following numbers: 1, 4, 5, 6, 7, 8, 9, 10. There probably is one missing as there is an extra hole in the wooden holder. The brass pieces turn on the handle. Otherwise there are no other identifying marks.

Can you identify this tool and tell me what it was used for? Also, what time period would this have been used?

Hugh E. Metzler
Mineola, TX

A I remember these tools being used by watchmakers to hold and clean balance wheels. Some used it to polish the balance, screws and all with the brush rubbed with chalk or rouge. Of course, this made the balance slightly lighter but also caused the watch to run faster. This tool sold for $1.50 in 1930.

Henry B. Fried

The following question was referred to Calvin E. Sustachek, CMW for an answer.

Q I have an Accutron 214 which gains 7 minutes a week and sometimes as much as 10 seconds a minute. The fork rate is correct in all positions, and also on low power. I just serviced and put in a new index wheel and sweep pinion. The fingers and pickup were adjusted 2 to 6 teeth, but it still gains.

Sometimes the index wheel will run with the pawl finger out of contact with the index wheel. When it does so, it runs very fast. Even though I have repaired Accutrons since they first came out, this is the first time I have seen this condition.

Earl F. Babb
Brooksville, FL

A Your question was referred to me for an answer. From your description of the problem, I'm sure you have a problem with a binding train. It should never advance when the pawl jewel is disengaged. If the train advances and runs even when the pawl jewel is disengaged from the index wheel, it indicates that the index wheel is not backing up when the index finger and fork moves back from the wheel. Under normal conditions the index jewel moves the wheel one and one-half teeth forward each time it vibrates one oscillation of the fork; however, the pawl jewel only picks up one tooth at a time. The index wheel actually is moving forward a tooth and a half and then back up one half. This is accomplished by the positioning between the index jewel and pawl jewel. That is what is done during the "phasing." If the train is binding in some way this action cannot take place and the train will be running fast.

You stated that you have replaced the index wheel and the sweep pinion. The binding could be in either part. Make sure the index wheel is free. One adjustment that is critical at the sweep pinion beside endshake is the tension and positioning of the center second brake spring P/N 121. With the sweep pinion out, the spring should be high enough that it will contact and depress when the pinion is installed. This part is held in place by the center bridge screw and must also be perfectly centered with the proper tension. Before you assemble the sweep pinion, look down through the opening and note the centering of this spring. It can be adjusted by loosening the center bridge screw, holding the spring in place, and then tightening the screw again. Be careful when tightening that screw because it has a tendency to move the spring just as the screw is getting tightest.

I have discussed your problem with Mr. Max Levy, who also was a C.A.T. instructor, and he agrees that your problem is a binding train probably caused by the index wheel. The train should never run when the pawl jewel is disengaged.

You mentioned that you adjusted the fingers and pick up 2 to 6 teeth. I assume that you are talking about the "drop off" when the fork is drawn back. You'll note that the drop off should be 5 to 8 teeth. If it is less than 5, the indexing will be too light. Also note that this check is done with the pawl jewel temporarily engaged with the wheel to hold it in place.

I hope this information will be helpful in solving your problem. If you have further questions please don't hesitate to contact me.

Calvin E. Sustachek

Our Readers Write

MEMBER'S ADVICE IN REPLACING CASE TUBES

The following letter was sent to James Adams referring to his "Novice Watchmaker" article in the June 1987 issue of **Horological Times** *(page 14).*

Some time ago I read your article on replacing case tubes, an often overlooked repair, but so important. I would like to add a very important step to your article.

This step came about through experience. I had the misfortune one day (when I was quite young) when I tapped and pressed the tube in place (I thought I was very careful at this time), the back would not screw back on. After some very anxious moments, I finally straightened the case and the back screwed back on fine.

For years I was an Omega service center (and some other high grade brands) and I had a very strict policy that my watchmakers adhere to my method of replacing tubes without variations. That method was to **replace the back on while replacing the tube during the tapping and pressing so that the case had the support and strength so necessary to prevent problems.** My watchmakers knew never to vary from my method or we would have a serious talk. My customers expected, as all customers, a proper service.

I hope that you are able to include this in one of your articles so that someone does not have to undergo the anxious moments I had many years ago.

Richard S. Nieto
Metairie, LA

A LETTER TO STEVEN CONOVER

I am writing a quick note to express my thanks for your well-written articles. What's prompting this letter is your articles on the Herschede 2-weight 5-tube clock movement. About six months ago, I had the privilege to repair a movement similar to this, except the one I worked on was a 9-tube movement. The main difference in these movements is that the gong of hammers on the top bar shifted sideways over the pin barrel for the choice of Westminster, Whittington, or silent. The personalized plate on the front of the dial attested to its age. It was a Christmas gift to the present owners' great grandfather in 1918.

The nine tubes were cracked with age and new supporting cords were required for repair. The tubes were hung in an offset pattern within the same width as the five tubes are.

I had only one problem which seemed to plague me: after the repair and testing periods the clock was returned to the home. The customer complained weeks later that the clock would sometimes chime out of sequence or once in a while continue counting, and/or the chime/strike train would continue to run without striking for a long time and even once ran until the weight ran to the end of the cable. I found the trouble after tracing and observing. It was the detent (part # 2 labeled on your drawing on page 24, February '88 issue) that would sometimes hang up, not allowing the locking lever to drop down and stop the train.

I look forward to your articles, even though I don't always get a chance to read them right away upon receipt.

Robert Webb
LeMars, IA

ARCHIE PERKINS' LATHE COURSE

I have just returned from attending the AWI Bench Course entitled "Using the Watchmaker's Lathe," held this past week in Chicago. I wanted to write and let you know what a worthwhile experience it was. Archie Perkins is not only an expert craftsman, but a great teacher as well. The information gleaned from the course more than met my expectations.

I also want to express my appreciation for AWI in general, and the people that make it such a great resource. Requests for service, technical or otherwise, are always handled quickly and courteously. The membership fee and search fees are truly a bargain.

Congratulations on a job well done!

Stephen Kaloyanides, Jr.
Winchester, MA

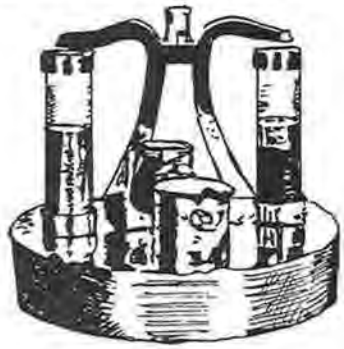
BULLETIN BOARD

A. NEW REQUESTS

CLEMENT LATHE COMPANY COURSE
From Fresno, California a member writes seeking information about a home study course he has heard about involving the use of the watchmakers lathe. The course was published by the Clement Lathe Company. Our Fresno member would like to know if a reader might have a copy of this course that he could copy. If you can provide a copy, AWI Central will copy it for our member and return your copy to you unless you wish to donate it to the AWI Henry B. Fried Library.

AGAIN: HERSCHEDE CLOCK PARTS
Since our last request, we have had several responses from people who had information leading to very limited supplies of Herschede material, but the requests for a substantial source for Herschede clock material. Once again we seek information about where readers can turn to for Herschede clock material.

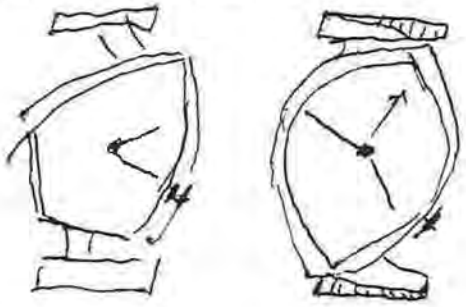
MERCURY FILLED GLASS VIALS
A Brooklyn, New York member seeks a source for mercury-filled glass vials to fit the pendulum of an antique Gustav Becker 400-day clock as shown below. We would like to develop a list of sources for all sizes of mercury-filled glass vials and would appreciate our readers' help.



ANSONIA SWING CLOCKS
The Ansonia Clock Company made a series of six "swing" clocks. The one shown (at right) is called the "Hunter." These clocks were fitted with 8-day movements. Other clock manufacturers have made similar style clocks. A Connecticut member seeks measurements and a drawing for the suspension spring. He has already tried a small piece of mainspring in the "chocks" which did not do the job.

Any data a member is able to supply on these clocks will be greatly appreciated.

HAMILTON ELECTRIC WATCHES
Below is a rough sketch of two Hamilton electric watches produced by the Hamilton Watch Company. A member in Illinois would like to know the name that each model was marketed under. Can you identify one or both of them?



MILITARY TIMEPIECES
Marvin Whitney, Alexandria, Virginia writes: I am in the process of writing a book on military timepieces. Presently, some articles on the subject are being serialized in *Horological Times*. I am looking for service technical sheets, booklets, catalogs, pictures, etc. on aviation, ordinance, marine and naval timepieces.

One catalog in particular is a 1940 Longines catalog showing Weems, Lindbergh, Coast Guard Lighthouse Service, etc. wristwatches. If you are a collector and have pictures (preferably black and white) I would appreciate hearing from you and will give you a credit line in the book if we can use it. Please drop me a note c/o AWI Central and let me know what you have.

B. RESPONSES

SQUARE DOMES
We have received a source for custom-made square glass domes.

We continued to receive responses regarding:
Cylinder "Shells" or "Blanks"
Computer Programs
Aircraft Clocks

C. ITEMS STILL NEEDED

We are still seeking help with the following requests.

GRAPHITE IN GOING BARREL
A Texas member writes: I have worked on several Chelsea clocks and was puzzled to find graphite in the going barrel. The first time I simply replaced it with mainspring grease. After finding it in a second clock, I am wondering if it was done by design. Could you give me some information on this?
EDITOR'S NOTE: We have heard of graphite (or similar

material) being liberally used on certain modern German clocks. This is particularly true of cuckoo clocks. We have not heard of it used in the manner described by our Texas member. Please drop the "Bulletin Board" a note if you have observed the use of graphite or similar material used in this or any other manner. Of course we are familiar with the customer inflicted WD-40 applications; please don't write about them.

UNIDENTIFIED TRADE MARK

We have searched our files as has B. Jadow & Sons, Inc. for the identification of the trade mark (reproduced below) without success. We will appreciate any help we can get with its identification.

CASES FOR MECHANICAL CHRONOGRAPH WATCHES

AWI often receives requests for a source for cases for the older mechanical chronograph watches. The most recent request was for a Landeron calibre 248 case.

We would like to develop a list of reliable sources for these specialty cases as well as a list for dress watch cases, for mechanical name brand watches.

FLORAL CLOCKS

A Wisconsin member has taken on the task of restoring (or replacing) a floral clock for his community. AWI has received requests from others in the past regarding floral clocks; they seek sources for:

* replacement parts
* complete clock units
* technical information
* service.

DO YOU HAVE INFORMATION REGARDING THIS MONTH'S REQUESTS?

If so, please write us at:
"Bulletin Board"
HOROLOGICAL TIMES
3700 Harrison Avenue
Cincinnati, OH 45211

Thank You!

Bench Tips

Joe Crooks

DRYING WITH AIR

This month's tip is from James Reeh of Orange, TX.

I keep reading about the different methods jewelers and watchmakers use to dry their jewelry and watch cases after cleaning. I would like to share with you my method.

Some 20 years ago we installed a small air compressor with a holding tank in our shop. All our jewelry repairs, watch cases, bands, etc. are cleaned in an ultrasonic machine, then steam cleaned and blown dry with air pressure. The entire drying process on a case and band takes about ten seconds.

Compressed air is also a quick way to remove excessive cleaning solution and then excessive rinsing solution from clock parts before they are dryed in whatever type heat you use. This prevents spotting. CAUTION: When blowing off excessive solution do not blow long enough to quick cool or moisture will form, followed by rust. Have your clock dryer heated up before clock parts are removed from rinsing solution.

You did not state what kind of cleaner you used in the ultrasonic machine before steam and blow drying. We assume you use a commercial cleaner in the ultrasonic machine. I still use the "old timer" mix for cleaning watch cases – 1 oz. oleic acid, 4 oz. 28% ammonia, 4 oz. acetone, and 1 gal. water. Rinse under 180° hot water.

I have never seen a commercial cleaner that would clean a watch case as good or quick as this mixture will. It will also take off 3 or 4 layers of your skin if you do not use plastic gloves.

A word of warning to anyone who has never steam cleaned jewelry–**some stones will not stand steam cleaning. They will change color or may crack if subjected to quick temperature change or high heat.** *This has been known to make some unreasonable customers angry and they may want to question your ancestry.*

SEND YOUR TIPS TO: Jingle Joe, AWI Central, 3700 Harrison Avenue, Cincinnati, OH 45211.

AVOID DELAY IN ANSWERING YOUR TECHNICAL REQUESTS

BE SURE TO ENCLOSE PAYMENT OF A $2.00 HANDLING FEE FOR EACH REQUEST MADE OR ENCLOSE YOUR BLUE AND WHITE MEMBERS TECHNICAL REQUEST IDENTIFICATION CARD WHICH ENTITLES YOU TO FREE SERVICE.

IF YOU USE THE HOTLINE, GIVE CHARGE CARD OR BILLING INFORMATION. PAY STATEMENTS IMMEDIATELY UPON RECEIPT FOR ADDITIONAL SERVICE. PROCESSING FUTURE REQUESTS WILL BE DELAYED IF OUR COMPUTER FILE SHOWS UNPAID CHARGES IN YOUR NAME.


1988
MEMBERS' FREE TECHNICAL INFORMATION
As recommended in the Fee Policy adopted by the Board of Directors (see reverse side), this card entitles you to 12 free technical searches during 1988.

John Doe, CMW
1234 Main Street
Cleveland, Ohio 42311

ENCLOSE THIS CARD EACH TIME YOU SEND A TECHNICAL REQUEST TO AWI. IT WILL BE RETURNED ALONG WITH YOUR ANSWER.

1 2 3 4 5 6 7 8 9 10 11 12

Expires December 31, 1988

Novice Watchmaker

James Adams, CMW

AWI CERTIFICATION

For this article we invite the journeyman horologist as well as the novice to consider the content. Each of us, as professionals, strive to attain perfection of service to our patrons. Many of us are driven by an internal compulsion to be the finest horological professional possible.

But what visible sign is there to separate us professionals from the kitchen hacks? Just because we bestow on ourselves the lofty, grandiose title of horologist, does not make it so.

Fortunately, over the years, AWI has developed a means to gauge the competency level of our membership on a voluntary basis. Through a controlled and careful examination of qualifications, American Watchmakers Institute can certify to the public at large the competency of the horologist they are dealing with. The combination of leadership, logo display, and certification can, and does, bring a certain degree of well-founded confidence to our patrons.

The certification of members falls in specialty groups—clockmaker certification, electronic watch specialist certification, and watchmaker certification. Any member may pursue one or more of these specialties.

CLOCK CERTIFICATION comes in two grade levels: Certified Clockmaker (CC) and Certified Master Clockmaker (CMC). The award of CMC would mean your ability is equal to that of a fully competent clockmaker, with the CC being slightly less so. The personal satisfaction and prestige of being a holder of either degree is beyond value.

You can write AWI Central and receive a free copy of their information on the Clockmaker Certification which describes, in detail, the practical and written aspects of the examination as well as costs.

CERTIFIED ELECTRONIC WATCH SPECIALIST: The CEWS Certification is in the area of electronic watches only. It covers balance wheel electrics, tuning fork watches, and quartz watches. Here the exam covers the practical repair and timing of electronic watches as well as a comprehensive understanding of electricity, electronics, and magnetism. Not to fear, the written exam is oriented only to the understanding of electric principles which apply to the electronic watch. As with the clock certification, AWI will supply you with a free copy of their information on the CEWS certification.

CERTIFIED WATCHMAKERS AND CERTIFIED MASTER WATCHMAKERS: To quote from AWI's *Information on Watchmaker Certification Examinations* booklet: "What is certification and what will it mean to you?" Certification is taking and passing an AWI proficiency examination in watchmaking. The examination, established and conducted by AWI, is open to practicing watchmakers, graduates of horological schools, and lay persons interested in horology. The test constitutes a uniform standard recognized by employers and the public throughout the world.

AWI offers three proficiency examinations leading to the Certified Watchmaker and Certified Master Watchmaker certificates. One of the examinations, the upgrading examination, is designed to allow a CW to achieve the CMW level of certification. AWI also offers a separate examination for the title of Certified Electronic Watch Specialist. Information about this examination can be obtained from AWI Central.

The Certification Examinations are designed to:

(1) Raise the standards of the craft by providing a reasonably difficult test against which the watchmaker can measure his/her skills.

(2) Award certificates which universally identify its possessor as a competent and skilled craftsman.

In addition to aiding a competent workman to obtain wages commensurate with their ability, certification helps employers

get more work at better prices from the public, since experience has shown consumers that an AWI certificate is assurance of expert service.

To the watchmaker, the values of certification include:

(1) Display of the Certified Watchmaker or Certified Master Watchmaker certificate and decals are evidence that the individual craftsman is a skilled and competent source for watch repair. The certificate is proof of the watchmaker's ability.

(2) The Certified Watchmaker and Certified Master Watchmaker are more highly regarded by their customers and the public; hence, prestige and additional recognition are accorded them by fellow watchmakers.

(3) Certified Watchmaker and Certified Master Watchmaker certificate holders possess the additional confidence that only proven skill can give.

These exams (CC, CMC, CEWS, CW, and CMW) are not necessarily difficult, but they do require you to be of professional calibre. Being that, you will succeed. There is much work involved here, but only what a patron would expect of you in your shop.

Do yourself a favor and write AWI Central to request the desired information booklet. It may be that you will want to secure your AWI Certification either now or later. You and your patrons will be better off for it.

Book Review

OFFICIAL PRICE GUIDE TO WATCHES–Eighth Edition. Comprehensive coverage on European and American watches, including wristwatches. By Cooksey Shugart and Tom Engle. 5¼"x8", 553 pages, 1275 illustrations, soft covers. Published by House of Collectibles, 1988, at $12.95.

These price guides and identification yearly editions have become the most referred-to publications by the dealer and collector of American watches. Its annual editions have chartered the changes in popularity and values of vintage watches.

This 1988 edition is 87 pages longer with more illustrations and updated 13,600 values. This new book contains more overseas watches and many more wristwatches, though it cannot claim to be a guide for wristwatch collectors yet.

The authors indicate by these current values that prices are again showing faint signs that prices are beginning to rise once more. While not approaching the general highs of over a decade ago, still there are signs which are encouraging. 1987 created a new high for a watch at auction when a 17th century enamel and diamond watch by Jehan Cremendorff brought $1,038,889. This too is pictured, among others.

Some current values of American items have lost value. One listed example is a Waltham made for and labeled "Canadian Railway Time Service." However, a P.S. Bartlett 18 kt., ¾ plate, pat. Nov. 30, 1858, estimated in the 1987 edition for $675 is currently appraised at $1420.

The book shows much evidence of serious rearrangement and upgrading of illustrations of movements and the inclusion of rare ones previously not shown. Others have been deleted in favor of more representative examples.

Minute repeaters of Audemars Piguet made for Webb C. Ball with the latter's signature is estimated to bring $6000 for one in average condition and up to $9000 for one in mint condition. Such a watch without the Ball signature would barely bring half those estimates.

Elgin watches, according to the book's surveys, have not appreciated in value. This is regretful, as this reviewer believes that the older Elgins, especially the highly jeweled timepieces, are undeservedly the most underrated of fine old watches.

In the Elgin section is shown a very rare 12 size 8-day, 21 jewel watch with winding indicator. The authors have placed an estimated value on this between $2000-$3000. Imagine if this rarity were Waltham, Hamilton, or Howard.

New England duplex escapemented watches with dials of horses, cards, and ships are priced at $150, although such watches were bringing much better prices at the last national NAWCC convention in Orlando.

Watches of overseas origin occupy an expanded section. Noted, however, is the Charles Frodsham karrusel, which in last year's edition had its escapement carriage: "the whole mechanism revolves about once every 60 minutes." This year the statement has it doing the same thing in 59 minutes. At this rate it should take six and a half more new editions to get it right (to 52½ minutes). Because this escapement revolves around a fixed wheel, seven and a half minutes are gained, although the seconds hand does indeed indicate minutes. Incidentally, some karrusels revolve once in 41 minutes; still rarer ones in 34 minutes (with centered seconds); and still others, more desirable to collectors, revolve even faster.

The eleven-page section on Pocket Watch Terminology is not up to the standards of the rest of this book, nor has it received the same attention by the authors that the rest of the book exhibits. It would be best done over, assigned to someone with lexicographic experience. Many of the definitions remain either incorrect, vague, or keep searching in vain for a referring similarity. Example: "Balance Cock—The bridge that holds the upper jewels and balance" [so why is it called a cock and not a bridge?]. Another: "Discharge Pallet Jewel—The left jewel" [viewed from which direction?]. One more: "Anchor Escapement—Also called the recoil escapement" [there is no definition of *recoil escapement*], and so on.

Despite these weaknesses, the overall value of the book is very good, and serves an important need. For those who do not own a copy, it is a veritable encyclopedia of American watch identification, age, and appraisal guide. Its various sections discuss buying and selling instructions, histories of the various 140 American makers, and over 500 foreign makers listed.

Henry B. Fried

SHOP TALK

Wes Door, CMW

Quartz Cleaning

Most quartz watches today are analogs (with hands); therefore, we will concentrate our discussion on cleaning them. However, let's start with a few remarks about LCDs.

LCD

Although many of the LCD (Liquid Crystal Display) watches are inexpensive and not worth cleaning, there are some good ones that are well worth a reasonable amount of attention.

Since LCD watches have no moving parts in the module, they require little attention and, of course, the module itself does not need oiling. Cleaning is necessary if the watch is rusty. Rust must be removed from the circuit board and around screw holes, battery contacts, and other parts that need to make good contact.

In every day bench work, we find that the LCD cases and especially the pushers need cleaning. The pusher gaskets should be lubricated with a silicon which is also used to lubricate the back gasket on water-resistant cases.

ANALOG

We need to remove the movement from the case in order to properly clean the movement and the case. In order to remove the movement, it is generally necessary to first remove the stem (with crown) to separate the case from the movement.

The stem is held in place by a detent. This detent is attached to a detent post (instead of a screw as in older mechanical watches). This part is held in place by a flat spring or some other type of spring loading device method to accomplish the task of holding the stem into the watch. In older "non quartz" movements, we would always pull the stem out to the *set* position before loosening the detent screw and removing the stem. This prevented the clutch wheel from slipping out of the setting lever and also prevented the headache of backtracking by removing hands, dial, and several winding and setting parts.

Getting back to our quartz movement, we must find the lever (or pin) to push to release the stem. It is not true that some factories try to hide the release lever; it just seems that way sometimes. Sometimes an arrow is engraved on the movement with the word *push*. If there is no evidence of this release pin, pull the stem out to the set position and then look for it, as it may have a release that will come into view only after we position the stem in proper position. (Also note, there may be a second and third position if the watch is a calendar model, and the in-between second position may be the one to use while removing the stem.) After removing the movement from the case, the stem should be immediately placed back into the movement. This keeps the setting parts in position and it keeps the watch movement in the running position. **If the stem is in the setting position the electronic portion is disconnected causing the watch not to run.**

CLEANING ANALOGS

1. Remove the circuit board. Normally two or three screws are holding it to the pillar plate. Notice the screw lengths. If they are different, lay them aside in an orderly fashion so later they will be put back into their proper location.

2. Remove the coil unit. Normally there are two screws to loosen (one on each end of the coil), and remember slips don't count. Some coils have a cover to remove before removing the coil itself.

3. Check the cell well area and remove plastic insulator (if it has one).

4. Now the remaining train may be cleaned by our usual methods. Some use an ultrasonic machine to clean these and have One Step® or other similar lubrication solution in the last rinse. However, many feel that this self-lubrication solution should not be used at all on quartz. Some also feel that a hand cleaning method is better than running the train through the cleaning machine. This train section is a very small part of the watch area once we have removed and hand cleaned the balance of the movement.

There seems to be several opinions on the ideal amount of oil to be used, if any. It seems that most agree that oil should be used, but in very small amounts. We do not want to over-oil. There are those who feel that, in some cases, a very small amount can be distributed by using a very sharply pointed piece of pegwood and dipping its point in oil.

It is very important to have the wheels clean and dry before oiling. The rotor should be hand cleaned only and a very small amount of oil on its bearings (of course, no oil on the rotor).

CASES

Cases (and bands too) should be thoroughly cleaned and dryed. Ultrasonic and/or steam cleaning are good methods and drying is a must.

With a little care, quartz watches are easy and even fun to clean.

We Salute These New Members!

ANGEL, Jose Antonio–Washington, DC
BARR, Peggy–Marshall, TX
BONHAM, A.K.–Holtville, CA
BOURAY, Myron–Hardy, NE
BUSH, Dave–Grafton, MA
CALLANEN, Michael–Norwalk, CT
CARRIERE, Paul Gary–Sulphur, LA
CHIDDIX, J.–Evergreen, CO
CLARK, Stanley R., Jr.–Traverse City, MI
DEBONS, Robert–Waverly, NY
DIX, Verlin J.–New Orleans, LA
EIKE, Larry–Winnett, MT
Sponsor: James Sadilek–Las Vegas, NV
EWING, Barbara–Mobile, AL
FERRIS, Joel E.–Corpus Christi, TX
FLETCHER, Robert–Parma, OH
GARDNER, Stephanie M.–Chickasaw, AL
GEBREHIWET, Tesfagabir P.–New York, NY
GLEZER, Sam–Chicago, IL
HILL, W.R.–Ventura, CA
HOPPER, A.W.–St. Petersburg, FL
HOWARD, Robert Duane, Jr.–Kilgore, TX
JOHNSTON, Tim–Sherman, TX
JONES, Arthur V. Hunt–Richmond Hill, NY
KIM, C.J.–San Antonio, TX
Sponsor: John J. Duff–San Antonio, TX
KIRSCH, Jeffrey–Atlanta, GA
KREICHBAUM, Richard A.–Barton, NY
KROH, F. Andrew–Colonia, NJ
Sponsor: Frederick A. Kroh, Jr.,
–Boca Raton, FL
LESTER, Charles–Louisville, KY
LEWIS, Earle M.–Indianapolis, IN
LEWIS, Raymond Keith–Austin, TX
LOUGHLIN, T.S.–Mishawaka, IN
McPEEK, Jan–Columbiana, OH
MIRANDA, Jose Daniel Otero–Carolina, PR
PUTZER, Richard–Oshkosh, WI
RONALTER, Michael J.–Urbana, IL
ROSSMAN, Steven–Cambridge, MA
ROTHEN, Robert Louis–Clarksburg, MD
Sponsor: George Tresansky–Kensington, MD
ROUSSO, Harold–Charlotte, NC
SARDELLA, Lee L.–Phoenix, AZ
Sponsor: Peter K. John–Phoenix, AZ
SATTGAST, Lawrence–Spearfish, SD
Sponsor: Robert L. Starkenburg
–Rapid City, SD
SELBY, Thomas–Williston, ND
SHAW, Dorsy–Louisville, KY
SLOAT, Steven G.–Bellaire, TX
STASH, Stan–Wilkinsburg, PA
Sponsor: Albert G. Carman–Philippi, WV
STEVENSON, Kevin–Bellflower, CA
STRICKLAND, William D.–Weatherford, TX
TILL, Forrest C.–Laird Hill, TX
TROLL, Bruce–Mt. Kisco, NY
TSOU, Mike–Richmond, VA
TUGGLE, H.P.–Keysville, VA
WEBB, Herbert N.–Longview, TX
WELLER, Bernard–Seattle, WA
WETTSTEIN, Greg–Milwaukee, WI
WISDORF, Jerry–Roseville, MN
YANNICH, Louis A.–East Windsor, NJ

WATCHES Inside & Out!

Calvin E. Sustachek, CMW

Vibrograf Data 10

The Data 10 is a test instrument specifically designed for testing quartz electronic watches. The values of voltage, current consumption of circuit and motor, motor pulse, and pulse width are all shown on an LED display It has a power supply that can supply standard electronic watch voltages and an adjustable voltage to 10V. Battery voltages can be measured with or without a load. Coil resistance can be measured without disconnecting the coil from the electronic circuit.

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

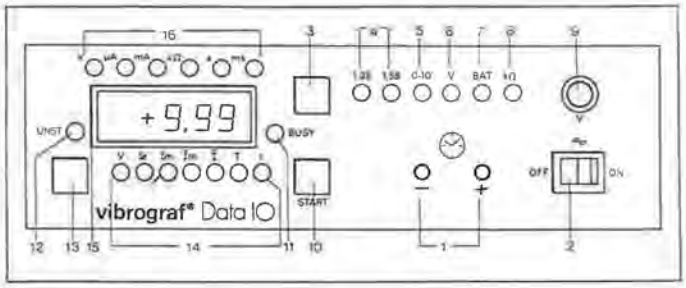


Figure 1

1 - Power supply/pick-off connectors
2 - Main switch
3 - Power supply, multimeter, battery test function selection key
4 - Indicator lamps for fixed supply voltages
5 - Variable supply voltage indicator lamp
6 - Voltmeter function indicator lamp
7 - Indicator lamp for "on-charge battery test" function
8 - Ohmmeter function indicator lamp
9 - Potentiometer for the adjustment of supply voltages
10 - Measurement triggering push button
11 - Busy indicator lamp measuring cycle in progress
12 - UNST indicator lamp measurement unstable
13 - Push button used to call up results (measurement parameters and values)
14 - Measurement parameter indicator lamps
V voltage
Ie current of electronic circuit
$\hat{I}m$ peak motor current
$\bar{I}m$ average motor current
$\bar{I}$ total average current
T period of motor
t pulse width
15 - Display
16 - Indicator lamps for units of measurement

BATTERY TESTING

Battery testing can be performed with no load and with a fixed load (refer to Figure 1).

1. Connect the power cell to the + and – terminals (1).
2. Press selector switch to illuminate voltmeter function indicator V (6) for a no load test and Bat (7) for a load test. Read voltage output on the LED display (15).
3. The Bat (7) condition applies a 1000 OHM resistance to the cell. This simulates the load of a watch when it's running.
4. This voltage should remain at the cell rating. If it drops off, the cell is weak and should be discarded.

When testing batteries, only apply the probes for a short period of time to avoid draining the power.

CURRENT CONSUMPTION

The Data 10 is designed to permit current consumption measurement of the electronic circuit (Ie), peak motor current ($\hat{I}m$), average motor current ($\bar{I}m$), and total average current ($\bar{I}$) (refer to Figure 2).

1. Connect the watch to input terminals (1) observing polarity.
2. Select the proper watch voltage using push button (3).
3. The nominal values, 1.35 or 1.55, are shown on the indicator lamps (4).
4. The actual values can be adjusted ± 10% by using potentiometer (9).
5. The value of voltage will be shown on the display (15).

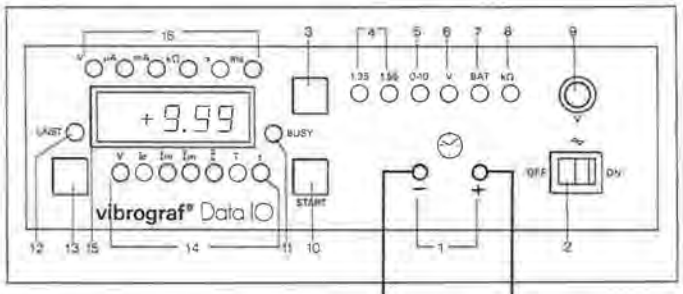
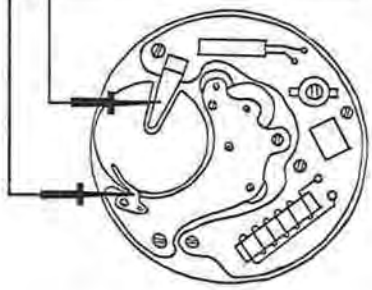


Figure 2



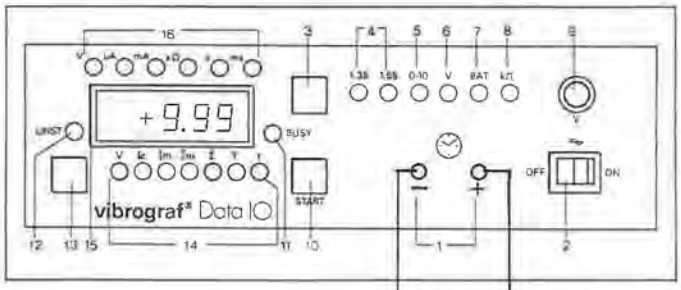
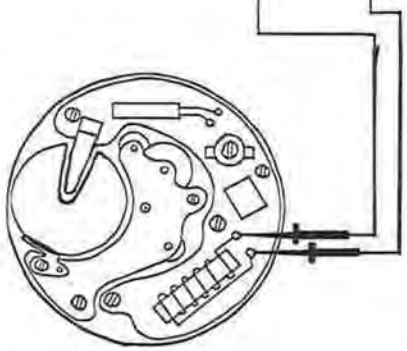


Figure 3



6. Press start key (10). If the measuring signal is too small, the UNST (unstable) indicator lamp (12) will illuminate. Check for proper connections.
7. The busy indicator lamp (11) will illuminate to indicate that the measuring cycle is being performed automatically.
8. At the end of the cycle, the busy indicator will go out and the results can be called up as required using key (13).
9. Any reading can be recalled by just repressing button (13).
10. The indicator lights (16) above the display indicate the measuring units.

This test unit has the capability to measure all the current

BENCH COURSES

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

MAY 1988			
15	T	Jasper, IN	BROUGHTON
JUNE 1988			
10	T	Lancaster, PA	BROUGHTON
SEPTEMBER 1988			
18-19	S	San Francisco, CA	BURCKHARDT
OCTOBER 1988			
8-9	W	Chicago, IL	GEIGER
14-16	V	Boston, MA	PERKINS

AWI BENCH COURSES P.O. Box 11011 Cincinnati, OH 45211

I am interested in your bench course to be presented on:

_____

at: _____. Please send information.

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

values of the circuit, the motor peak and average current, and the total average current. This total average current is the most common measurement. Early model watches will have higher current, later models lower. Most will be less than 5 microamperes.

The test unit can also measure the width and the period of the motor pulse–sometimes helpful in analyzing watches that draw excess power.

COIL CONDITION

The condition of the motor coil can be determined with the use of this meter (refer to Figure 3).

1. **There should be no battery in the watch.**
2. Using selector key (3) select function (8) K (indicator lamp will light).
3. Connect leads to + and – terminals of meter (1).
4. Connect to motor coil terminals (no polarity).
5. Measure coil resistance and compare to watch service manual.
6. It is not necessary to disconnect the coil from the circuit board since the measuring voltage of the ohmmeter function is only 0.2V. This is not a high enough voltage to flow into the electronic module.

CONCLUSION

The Vibrograf Data 10 is a diagnostic tool to make rapid and accurate measurements of all the components of a quartz watch. This enables a watchmaker to quickly determine the watch condition and make necessary repairs.

SUPPLY BRACKET #331

The supply bracket is a piece of optional equipment designed to be used with the Data 10. However, it can be used with most other watch testing units. It gives a steady support for the spring loaded movement holder. It has spring loaded gold plated contacts to make firm contact to the positive and negative terminals of the watch for testing. It also has a slanted mirror so that the dial side of the watch can be seen in the movement holder. The leads to the watch contacts plug into the back of the unit and they can be plugged into the test equipment. With slight modifications they can be easily used with any equipment.

HOROLOGICAL SHOWCASE

GOLD-CASED ASTRONOMICAL CHRONOGRAPH CHRONOMETER

The Worshipful Company of Clockmakers sponsored an "Exhibition of British Clock & Watchmaking Today" at Goldsmiths' Hall, London, England during October and November, 1987. The display did much to dispel the belief that there are no "real craftsmen" anymore. *Horological Times* has received permission to reproduce some of the items which were on display in Goldsmiths' Hall. We plan to feature one or more of these displays of horological excellence for the readers of *Horological Times* in the coming months. This month we feature an entry by AWI Fellow, George Daniels.

Gold-cased astronomical chronograph chronometer with two trains controlled by a single oscillator to produce Mean-Solar time and Sidereal time to within a ½ second per annum with the ratio of 1:1.002737923 between the two seconds hands which can be independently stopped and started for setting. The moon disc is driven from the Sidereal train to produce a phase period within ½ second per lunar cycle. This unique design for a Solar/Sidereal Timekeeper allows engagement of the center-seconds chronograph mechanism with either Sidereal or Solar time. The silver dial has an Arabic 24-hour dial for Sidereal time insert with moonphases and aperture for the age of the moon, Roman numerals for Mean-Solar time inset with aperture for the calendar; equation of time above. The diameter is 60mm.

TIMES

MILITARY TIME

Marvin E. Whitney, CMW, CMC, FAWI

ALL PHOTOS COURTESY OF
LONGINES-WITTNAUER WATCH CO.

1987 Replica of Longines Hour Angle Watch

Many of us are still able to remember Lindbergh's historical flight across the turbulent Atlantic, but few of us are cognizant of his many contributions to the science of aerial navigation. When he took off from New York's Roosevelt Field on May 20, 1927, few thought that he would be successful—many wondering why they even let him take off. However, 33 hours, 39 minutes, and 3,610 miles later, when he sat down on Paris's Le Bourget Field, the "Lone Eagle" instantly become a "world hero." This feat was even more remarkable when one realizes that it was accomplished without the aid of celestial navigation. He relied solely on his compass, his personal wristwatch, and luck—luck being the good fortune of encountering ideal flying weather conditions throughout the entire flight. Lindbergh had refused the installation of an instrument panel aircraft clock because it weighed more than his wristwatch. He was very weight conscious, weighing everything that was placed on board.

FIGURE 1. Longines second setting watch which was invented by Lt. Comdr. P.V.H. Weems, U.S.N. and used by Lindbergh in designing his hour angle wristwatch.

FIGURE 2. Steel version of the Longines hour angle watch.

Even with all the accolades that were bestowed upon him, he never lost sight of the need for a timepiece that would facilitate the determination of one's position in order to remain on course while flying at speeds greater than 100 miles per hour. Upon his return to the states, using Weem's second-setting wristwatch with a rotating second dial, he designed a watch that would readily calculate hour angles, a primary factor used in celestial navigation when determining one's longitude and/or position (Figure 1).

Lindbergh then showed his design to his very good friend, John P.V. Heinmuller, who was a pilot in his own right and an officer in the Longines-Wittnauer organization. Heinmuller was on hand to officially time Lindbergh's arrival at Le Bourget Field at 10:22 p.m., May 21, 1927.

FIGURE 3. Open back lid reveals commemorative engraving and watch movement, visible through water-resistant glass. Texture of oscillating weight recalls surface of Spirit of St. Louis cowling.

FIGURE 4. View of the extension strap allowing the watch to be worn on the cuff or sleeve.

Being one who appreciated the difficulties encountered when navigating unmarked water and land, Heinmuller immediately and enthusiastically saw the advantages and importance for such a timepiece. He presented the design to the factory technicians and became deeply involved in the production of this revolutionary designed wristwatch—a watch that permitted the "laying down of a position" in less than three minutes and a watch later used by U.S. Navy aviators in the early 1930s.

To commemorate the 60th anniversary of Lindbergh's epic flight, Longines has reproduced a limited edition of their "Hour-Angle" watch. The watch is an exact replica of the original watch as designed by Lindbergh, but is reduced in size by one-fifth (Figure 2). The functions and features are exactly as those of the original. The movement has 25 jewels, self-winding and encased in either a stainless steel, stainless steel and gold, or 18K gold case. A push pin at the four o'clock position releases the hinged back cover, showing the commemorative engraving and movement, visible through a water-resistant mineral glass crystal. The damascening on the oscillating weight depicts the surface design of the "Spirit of St. Louis" cowling (Figure 3).

The steel case watch has a white enamel dial with Roman numerals, black minute chapter ring, and blue hour-angle graduations. The center second dial has a satin silver finish with black second graduations on its outer orbit with small numerals at each 10-second increment. A secondary row of red numerals, 1 through 15, showing minute of arc, appear within the center seconds orbit.

All three models are available with genuine calfskin straps and/or a strap extension allowing it to be worn on the cuff or sleeve, as was often done by aviators of the period (Figure 4).

Longines announced their new reproduction to the world on the night of May 21, 1987, by reenacting Lindbergh's landing at Le Bourget Field. A replica of the Spirit of St. Louis first circled the field (as Lindbergh did) and then touched down before a festive group of 500 guests, many appropriately dressed in costumes of the era. At the same moment, the pilot of the Concorde flight from New York did a "tough and go" at Le Bourget before flying on to its terminus at Roissy, a spectacular gesture and moving tribute to the "Lone Eagle."

Actually, Longines was celebrating two events of international importance during the evening. When Union Carbide assembled 100 journalists and representatives of the watch industry in Paris to select the "1987 Watch of the Year," the model chosen was Longines's Lindbergh Hour-Angle watch. The group selected the watch because of its boldness and igenuity of Longines in applying its imagination and skill in creating a watch which was identified with a number of historical exploits carried out by pioneers who, through their life's work, hardships and experience, paved the way for today's flying.

By A. G. Simon

UNDERSTANDING THE PENDULUM CLOCK

Part 4

Adapted from the AWI correspondence course in clock repair.

FACTORS INVOLVING WHEELS AND PINIONS

In order to have an understanding about the design of a clock, one must have some basic understandings about wheels and pinions. The study of gearing is a fascinating and very complex one; we will present a brief overview of the subject. Serious students will want to study additional texts and articles on the subject of gearing. Generally it should be understood that the diameter of a wheel depends upon the radius of the pitch diameter of the pinion with which it is to mesh, and upon the ratio of the wheel teeth to pinion teeth, which from now on will be referred to as pinion leaves.

First, let us consider the action of two plain discs of metal that have been placed on pivoted arbors and arranged so that turning one will turn the other by the friction of their rims (similar to the train shown in Figure 1). For the sake of comparison, we will say that one of the discs has a diameter of 60mm and the other a diameter of 10mm. If we multiply the diameter of the larger wheel by Pi (60 x 3.1416) it will reveal the circumference of the larger wheel to be 188.496mm. By multiplying the diameter of the smaller wheel by Pi (10 x 3.1416) we determine that its circumference is 31.416mm. If we divide the circumference of the larger wheel by that of the smaller wheel (188.496/31.416) the result will be 6,

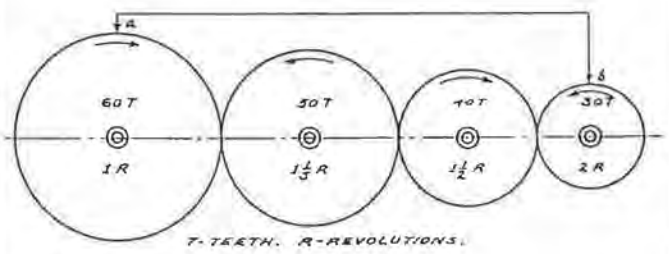


Figure 1

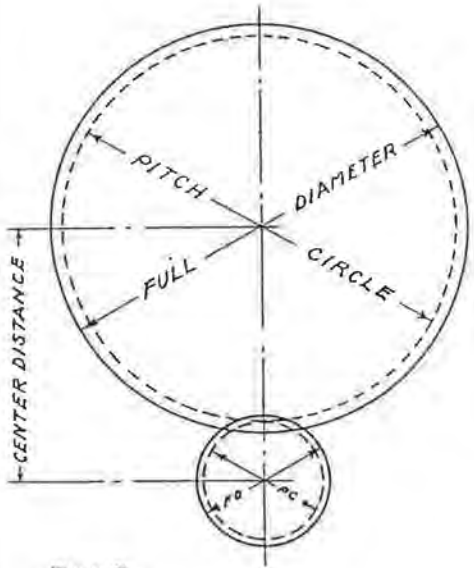


Figure 2

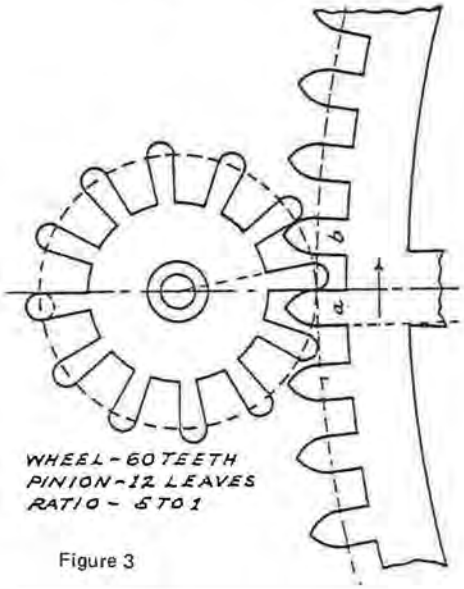


Figure 3

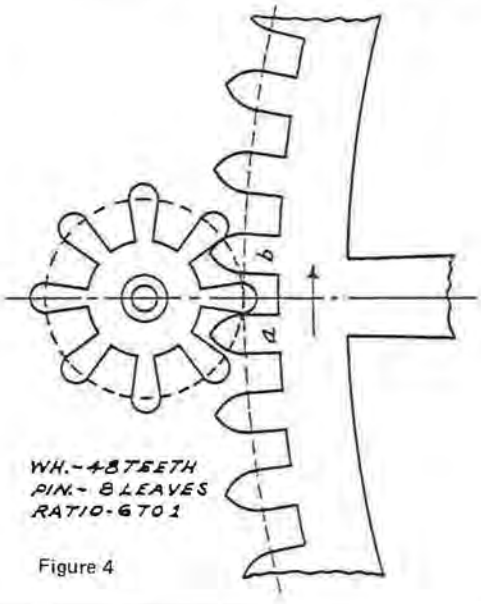


Figure 4

which is the number of revolutions the smaller wheel will make while the larger wheel is making one turn. If we divide the diameter of the larger wheel by the diameter of the smaller wheel (60/10) the result is also 6. This little exercise in mathematics shows that the relationship between the diameters and the circumferences of the two wheels is the same.

If it were practical to use wheels without teeth, rolling on each other their diameters would be inversely proportional to the number of rotations of their arbors. For example, we will say that the distance between centers of the arbors of two discs measures 35mm, and that the smaller disc is to make 6 revolutions to one of the larger disc; a ratio of 6 to 1. We divide the center distance by 7 (6 + 1). One-seventh of the center distance equals 5mm, thus 5mm will be the radius of the smaller wheel, its diameter will be twice the radius (2 x 5), or 10mm. The remaining six-sevenths will be the radius of the larger wheel (6/7 x 35 = 30), thus its diameter will be 60mm (2 x 30). Similarily, if the radius of the smaller wheel and the number of revolutions it is to make to one of the larger is known, we can find the radius for the larger wheel and the center distance.

It is not practical to construct a clock train with plain discs because they would slip on one another, but the circles representing the discs are the basis upon which toothed wheels and pinions are constructed, and are called pitch-circles.

The pitch-circle of a wheel is divided into the number of spaces required for the teeth. These spaces are further divided into two equal parts, one part being the space for the tooth, the other part being the space between two teeth.

The portion of the tooth which rises above the pitch-circle is called the addendum, or ogive. Its length is approximately equal to the width of the tooth or half the pitch. A circle drawn at the ends of the points of the teeth is called full diameter of the wheel; see Figure 2.

The pitch-circle of the pinion is divided into the number of spaces required for leaves; these spaces are referred to as the pitch of the leaves. If the pinions have 6, 7, 8, 9, or 10 leaves, each space is further divided into three equal parts, one part being for the leaf, the other two parts being for the space between two leaves. This is done to provide for the necessary freedom of the wheel teeth between the pinion leaves. If a pinion has 12 or more leaves, the space is divided into five parts, two parts are for the width of the leaf and three parts are for the space between the leaf.

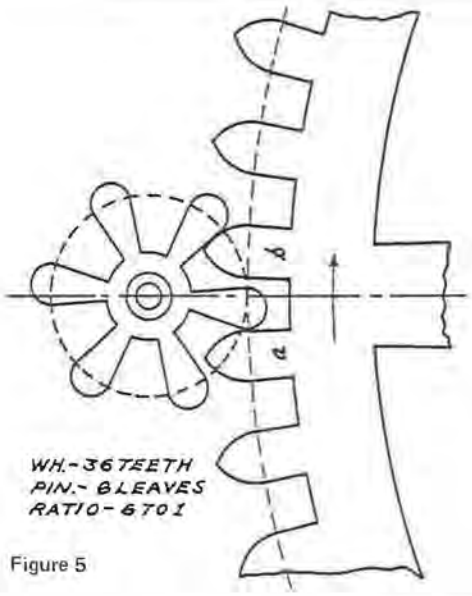


Figure 5

The pitch of the teeth of the wheel must be the same as that of the leaves of the pinion. This means that the distance between the centers of the teeth of the wheel, measured on the pitch-circle, must be the same as the distance between centers of the leaves of the pinion, measured on the pitch-circle. For the best action of the teeth, the contact of the teeth of the wheel with the leaves of the pinions should take place on the line of centers and on their pitch-circles as shown in Figure 3.

The work of the train is to transmit the power of the mainspring, or weight, to the escape wheel. The escape wheel in turn distributes it in impulses to the pendulum. The teeth of wheels and pinions are designed to transmit power with an even motion and a rolling friction of the teeth, the friction and action of the teeth being the same as the circumferences of the discs rolling on each other.

To keep friction to a minimum, the contact of the wheel and pinion teeth should take place on the line of centers as mentioned previously, and shown in Figure 3, in which this condition is being satisfied with a 12-leaf pinion. It should be noticed that both tooth "a" and tooth "b" of the wheel are in contact with leaves of the pinion, but tooth "a" has just relieved tooth "b" of the work of turning the pinion.

Figure 4 shows the meshing of an 8-leaf pinion with a wheel. Here the contact of tooth "a" of the wheel with the leaf of the pinion takes place one-half the width of the pinion ahead of the line of centers. Such contact does not take place on the pitch-circles of the wheel and pinion; this will result in wear of both the wheel and pinion teeth from the point of contact until they reach the line of centers. This wear, which is caused by sliding friction at the point of contact, is moderate, such as the power on the third or fourth wheel of a clock train.

With a 6-leaf pinion, the contact of wheel and pinion teeth takes place much before the line of centers is reached; almost the full width of the pinion leaf ahead of the center line (shown in Figure 5). Such a pinion should only be used where the power on the wheel engaged with it is very light, such as the fourth wheel of a clock or watch train.

The engagement of wheel and pinion teeth before the line of centers causes what is called "engaging friction" and as a result several of the teeth become pitted. The engagement of the teeth after the line of centers is called "disengaging friction," or "receding friction." When this condition is severe, it can cause the curves of the wheel to become flatter. Engagement of the teeth of the wheel and pinion, if properly depthed, occurs after the line of centers only with pinions of more than 12 leaves.

Before discussing depthing of wheels and pinions we should mention so-called "lantern pinions" which are generally used in clocks of moderate and low price. The lantern pinion consists of discs of brass, called shrouds, which are connected by round steel rods or pins. These rods or pins form the leaves of the lantern pinion. Figure 6 shows the action of an 8-pin lantern pinion with a wheel. The action and requirements are practically the same as the action and requirements of a cut or leaf pinion. Cut pinions are used in all high-grade movements, and frequently in lower grades as well.

DEPTHING OF WHEELS AND PINIONS

There is always engaging friction on pinions having fewer than 12 leaves. If the pitch of the pinion leaves is greater than the pitch of the wheel, in which case the pinion is really too large

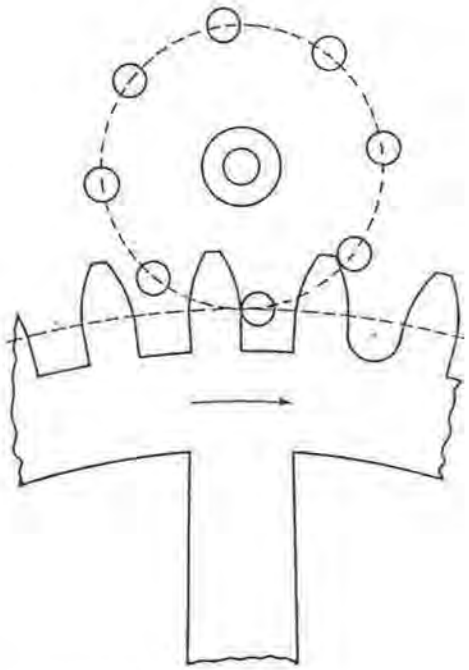


Figure 6

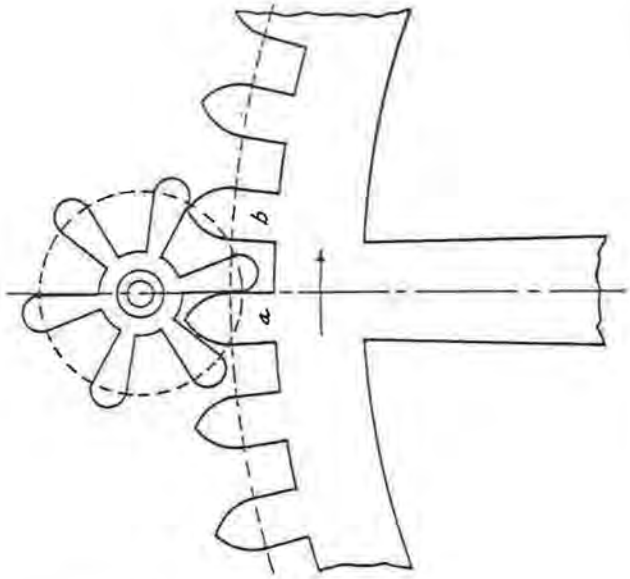


Figure 7

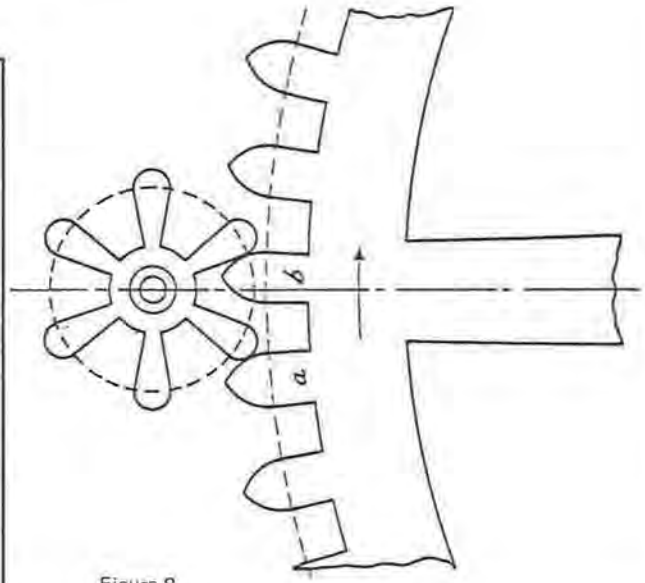


Figure 8

for the wheel, the condition would be greatly aggravated. If the pinion was much too large, there would be no action at all and the teeth would butt.

If the pitch of the pinion teeth is smaller than that of the wheel teeth, in which case the pinion would be too small for the wheel, the tooth of the wheel that is driving the pinion would conclude its action before the next tooth of the wheel came into contact with the next tooth of the pinion. This would result in the wheel tooth that is coming into action, dropping for some distance before establishing contact with the pinion. Such an action results in an interruption of the even flow of power necessary in a clock or watch train. This condition creates wear of the receding tooth of the wheel at its extreme point, and wear of the engaging tooth at the point of contact with the pinion leaf. In testing the action of the train with the pallets removed, the above conditions would result in a noisy action of the wheel and pinion.

Figure 7 shows a 6-leaf pinion of the correct pitch which is incorrectly depthed with the wheel. The dotted lines represent the pitch-circles of the wheel and pinion, showing that the wheel is meshed too deeply with the pinion. In this illustration we see that the contact of tooth "a" of a wheel is taking place on the line of centers, but tooth "b" of the wheel has remained in contact with the pinion leaf much too long, and is concluding its action with the point of the tooth. This results in sliding friction and wear at this point. If the depthing was made a little deeper, the point of tooth "a" would butt against the pinion leaf in back of it. Such a condition would result in stopping the motion of the wheels.

If the depthing is only slightly too deep, tooth "b" of the wheel may disengage before contact has been established by tooth "a." This results in a slight drop of tooth "a" on the pinion leaf, similar to the action when the pinion pitch is smaller than that of the wheel, as described previously. This condition results in loss of power and a noisy action of the train when it is tested for freedom with the pallet removed.

Figure 8 shows a 6-leaf pinion of the correct pitch which is incorrectly depthed with the wheel. The dotted lines represent the pitch-circles showing that the wheel is meshed too shallow with the pinion. Tooth "b" of the wheel does not drive its pinion leaf for a sufficient distance which results in tooth "a" of the wheel coming into contact with its pinion leaf much too far before the line of centers. This results in a butting action. If the depthing is much too shallow, the butting action will be so severe as to stop the motion of wheels.

The conditions shown in Figures 7 and 8 are most troublesome with a 6-leaf pinion. For this reason, 6-leaf pinions are seldom used in low-priced movements where workmanship is not always at its best. The correction of the conditions shown is made by correcting the depthing. This can be done by repairing the pivots, or pivot holes of the wheel and pinion so as to make their center-distance correct. The study of repairing pivots and closing worn pivot holes will explain how this is accomplished.

FORUM

The FORUM is a column devoted to the discussion and debate of horological piffle, practices, and problems. Comments can be controversial, but should always remain within the bounds of good taste. Responses should be sent to: **AWI FORUM, P.O. Box 11011, Cincinnati, OH 45211.**

By

Albert Dodson
CMC

Ralph Geiger
CMW, CMC, CEWS, CMBHI

LIMITS OF RESPONSIBILITY

At a recent guild meeting the subject of repair warranties came up. The speaker stated that he, being a trade watchmaker, provided a one year warranty for watches he overhauled. His reasons for doing so were partly out of tradition (standard practice within the trade in the past) and because he felt that if a customer paid $60.00 retail for a repair they have a right to expect a certain degree of longevity for that repair. He went on to say that his policy was to reclean a watch at no charge within 12 months even if it came back with the movement clogged with lint. This brought forth a number of comments from the membership asking why horologists continued this practice of offering repair warranties when no other industry had a repair warranty that exceeded 90 days.

What is the horologist's responsibility to a repaired item once it has been returned to its owner? Should horologists undertake the practice of offering a service agreement at extra charge? If it is your practice to always do the best job possible, is there a need to offer a warranty? Considering that watch manufacturers will not offer any warranty on electronic components, how general or specific should horological repair warranties be?

CHEMICAL DISPOSAL

Polution of public water supplies has been a concern for many years. One often hears of drinking water being contaminated with trichloroethane—a solvent used in many horological solutions. Several years ago, in an attempt to be a responsible citizen, I decided I would stop pouring my spent cleaning solutions down the drain and find an ecologically acceptable method of disposal for them. Being a bit of a procrastinator, I accumulated a closet full of old solutions before I finally got around to investigating disposal methods. I called a city office, and was referred to another office and told to call yet another office. After all the typical bureaucratic shuffling I got to speak with a man who, after asking me what it was I was trying to get rid of, told me to simply pour it down the drain. He informed me that dry cleaners pour hundreds of gallons of triclor into the city sewers daily and that my couple of gallons per month would not make any difference. He even went as far as to tell me it might help keep my drains clean. I was rather surprised by the city official's recommendation. Apparently other horologists have been given similar advice.

I still have reservations about dumping solutions down the drain. Are there better methods of disposing solutions that horologists can adopt or is this concern "much ado about nothing"?

GOT AN OPINION?
GOT THE FACTS?
WRITE US WITH YOUR THOUGHTS!

Technically WATCHES © 1988

Archie B. Perkins, CMW, FNAWCC, CMBHI

Antique Watch Restoration © 1988

Part XXIX

MAKING A FUSEE

After the power curve of the mainspring has been determined by the method shown previously, and the curve of the fusee is determined from the power curve, then one would proceed to make the fusee.

To cut the spiral groove around the fusee cone, one would need either a fusee cutting engine or an attachment for the lathe which could be used with the thread cutting attachment. The fusee cutting engine is an antique tool which is usually found in museums and is not always available for the watchmaker to use; therefore, the watchmaker must design and make an attachment for the lathe to do this job.

Figures 1 and 2 show such an attachment which was made up by the author a few years ago. This attachment was fitted to an old Wolf-Jahn slide rest which has three slides. The lead screw was completely removed from the top cross slide so this slide would be free to move back and forth by hand while cutting the different radii of the fusee. This slide, of course, carries the cutter for cutting the spiral groove. The lead screw of the longitudinal slide is connected to the thread cutting attachment by a rod and tube which has a universal joint attached to each end of this device. Change gears are selected for the thread cutting attachment which will allow the proper number of threads per inch or centimeter to be cut.

Figure 1 shows a side view of the fusee cutting attachment which is fitted to the slide rest, and Figure 2 shows a top view of the attachment. Refer to the two illustrations for a description of the device. View A shows the tracer bar attached to the side of the top cross slide of the slide rest. This is held in position by three screws. These screws are independent of the gib screws that are hidden behind the tracer bar. Note that the holes in the tracer bar are elongated so the tracer bar can be adjusted back and forth lengthwise on the slide. One end of the tracer bar has been filed down and threaded for a nut. This nut that is shown in View B is used when adjusting the active length of the tracer bar. The threaded end of the tracer bar goes through a hole in end

Figure 1

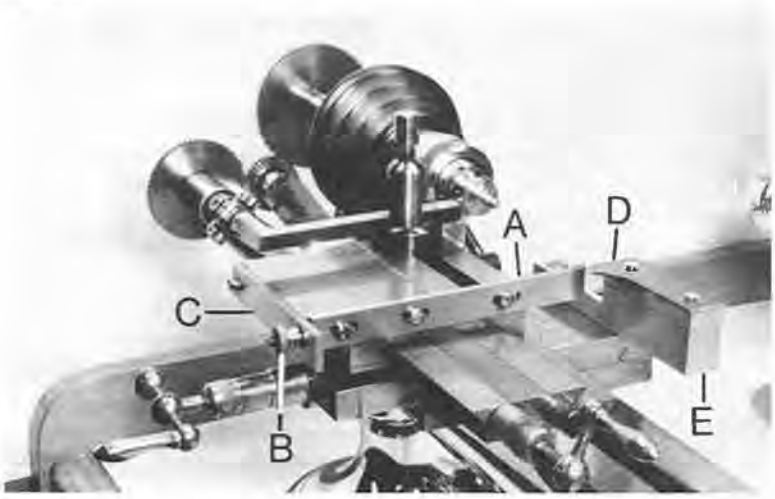


Figure 2

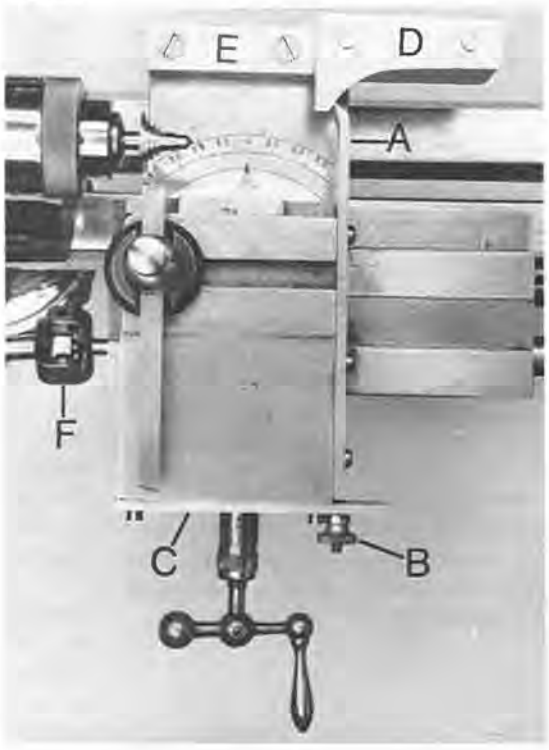


plate C which is attached to the end of the top cross slide by the same two screws which held the original end plate and lead screw. The other end of the tracer bar is bent and shaped so it can rub down the curve of the template to form the fusee. The template used for shaping the fusee is shown in View D. This template is mounted on top of a block with two screws, and the block which is shown at E is fastened to the top part of the bottom cross slide of the slide rest by two screws. The lead screw of the bottom cross slide is used to feed the cutter in each time a new cut is taken. When this screw is turned, it does not affect the relationship between the tracer bar and the template. The longitudinal lead screw on the middle slide is used to move the cutter back to the starting position after it has reached the end of the cut. The end of this screw is connected to the thread cutting attachment.

View F, Figure 2 shows the universal joint connecting the lead screw to the thread cutting attachment. Note: The top cross slide of the slide rest is free to be moved in and out by hand since the lead screw has been removed. It is very important that this top cross slide is free to move smoothly in and out but not have any excess play. When using the attachment to cut a fusee, finger pressure is kept against the end of the top cross slide to hold the tracer arm against the curved edge of the template while the cutter is cutting the groove around the fusee. When the end of the cut is reached, then the slide is pulled back to clear the tracer bar from the template and the cutter from the work. Then the crank of the middle or longitudinal slide is turned to move the cutter back to the starting position. In fact, the cutter is moved back past the starting position in order for all of the slack to be taken up before the next cut is started.

MAKING THE FUSEE BLANK

Two of the first steps needed in making a fusee are making the fusee blank and making the arbor for the fusee. This is shown in Figure 3. View A shows the making of the fusee blank. The fusee blank is made from a brass disc from either flat sheet stock or from a piece of brass rod. If a disc from flat stock is used, it is sawed from the stock, then drilled for the arbor. Then, the hole is reamed with a slightly tapered cutting broach. Now, the disc is fitted to a mandrel (tapered arbor) in the lathe spindle. Note: The taper on the mandrel must match the taper in the brass disc exactly to prevent the disc from loosening up on the mandrel during the turning of the fusee blank. The disc is faced to length with a cutter in the slide rest. The approximate curve for the fusee is gotten with a hand-held graver which has a rounded point. The dotted lines show the approximate shape of the fusee blank. Note: A round pointed graver made from round rod makes a good graver for this purpose. When shaping the fusee blank, it is very important to leave the blank over-sized because it will be brought to final size during the cutting of the steps and other finishing operations. The fusee blank can be made on the end of a brass rod if the lathe available has the capacity to hold a rod of that diameter. The hole can also be drilled before the blank is cut off of the rod. After the blank is removed from the rod, then the hole is taper reamed for the fusee arbor.

MAKING THE FUSEE ARBOR

The fusee arbor is made from high carbon steel drill rod of the water hardening type. Most watch fusee arbors are made with the fusee stop piece as part of the arbor. This is shown in View B, Figure 3. First, the blank is roughed out from a rod which is large enough in diameter to form the fusee stop piece. This either requires a larger lathe or the use of a 3 or 4 jaw chuck in the watchmakers lathe to hold the rod while the blank is turned down. Then the blank is chucked in a wire chuck in the watchmakers lathe. The short end of the arbor extending from the stop piece disc is left oversized. This end will later contain the upper pivot and the winding square. The other end of the arbor is turned to the same taper as the hole in the fusee blank. At the same time, the fusee stop piece disc is thinned leaving it slightly too thick. Make sure both sides are faced flat. Then the taper is filed to form eight tapered sides (octagon shape). This end of the arbor will later be driven into the tapered hole of the fusee blank.

Figure 3

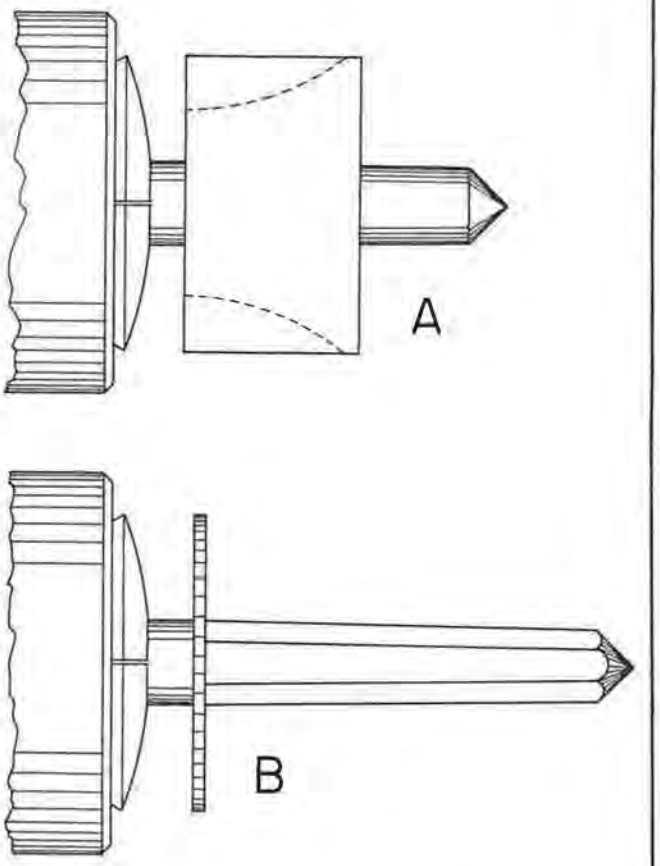
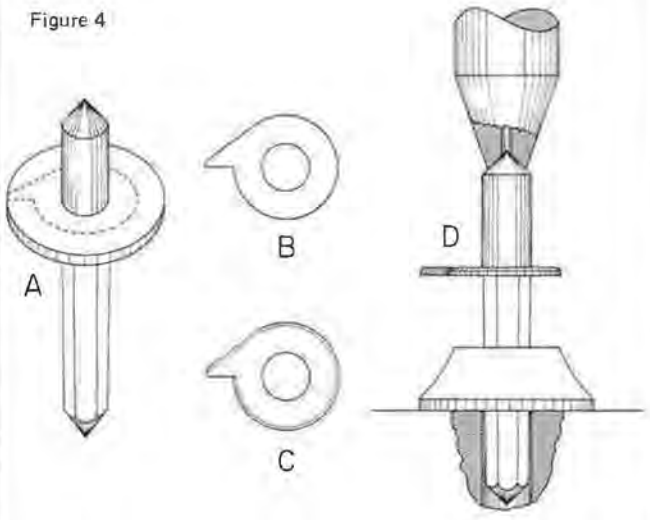


Figure 4



SHAPING THE FUSEE STOP PIECE

The shaping of the fusee stop piece is shown in Figure 4. This should be done prior to hardening and tempering the arbor. View A, Figure 4 shows in dotted line the shape of the stop piece. View B shows the shape of the stop piece after it has been shaped by sawing and filing. View C shows the stop piece after its corner has been beveled and polished. The beveling of the corner of the circular part of the stop piece can be done by using a cutter in the slide rest and turning the lathe headstock back and forth by hand while shaving the corner of the edge of the blank. The back corner of the finger would need to be shaped with a file or stone slip. The beveled edge can be polished with hand-held polishing slips and polishing compounds, or a pivot polisher can be used for this purpose. After the fusee arbor and stop piece have been shaped, then the arbor is hardened and tempered to blue. Then the arbor is staked into the fusee cone as shown in View D, Figure 4. To do this, the base of the fusee cone is supported on the die plate of the staking tool over a hole that will clear the arbor, then a taper mouth punch is used on the end of the arbor to stake the arbor into the fusee cone. Note that the arbor is staked into the fusee cone from the small end of the cone; therefore, the hole in the fusee cone should be reamed from the small end of the cone with a tapered cutting broach.

FUSEE WITH A DETACHABLE STOP PIECE

Figure 5 shows a fusee with a detachable stop piece. This style of stop piece is usually used in marine chronometers and clocks where there is more space. However, it can also be used in watches provided the screws used to hold the stop piece to the fusee do not protrude above flush with the surface of the stop piece. The arbor for this arrangement is made from smaller rod and filed the same way as the arbor with an attached stop piece.

CUTTING THE CORRECT FUSEE CURVE

After the fusee arbor has been staked tightly into the fusee cone, then the fusee cutting attachment is set up to finish making the fusee. Figure 6 shows the fusee cutting attachment in position and the correct curve is being cut on the fusee cone. A special shaped cutter is used in the tool post of the slide rest to cut the curve. The end of the tracer bar is following the curve on the template as the cutter cuts the curve on the fusee cone. The lathe headstock is turned by the lathe motor when this operation is done. The part of the curve on the template is used that produces a correct shape of curve on the fusee cone. The starting and stopping points are marked on the template. The handle on the middle or longitudinal slide is used to bring the cutter back to the starting point at the large end of the fusee. Three or four passes down the fusee curve with the cutter may be necessary to shape the fusee. Very light cuts should be taken with the cutter. The cutter is held against the work and the tracer bar against the template by applying pressure with the fingers on the end of the top cross slide of the slide rest. The handle on the bottom cross slide is used to feed the cutter deeper into the work. When cutting the curve on the fusee, the cutter is placed at the starting position at the large end of the fusee. Then, as pressure is applied inward on the top cross slide, the cutter is brought to the fusee cone so a light cut will be taken. Now, as the lathe spindle is turning and pressure is applied to the top cross slide of the slide rest, the handle on the middle or longitudinal slide is turned to bring the cutter down the curve of the fusee to cut its shape. Note: The tracer bar must be held against the template during the cutting operation.

PREPARATION FOR CUTTING THE CHAIN GROOVE

To cut the spiral groove for the chain, a different cutter is used and the fusee cutting attachment is connected to the thread cutting attachment which has the proper change gears to cut the correct pitch thread.

SELECTING GEARS FOR THREAD CUTTING ATTACHMENT

To select the proper gears for cutting the groove on a

Figure 5

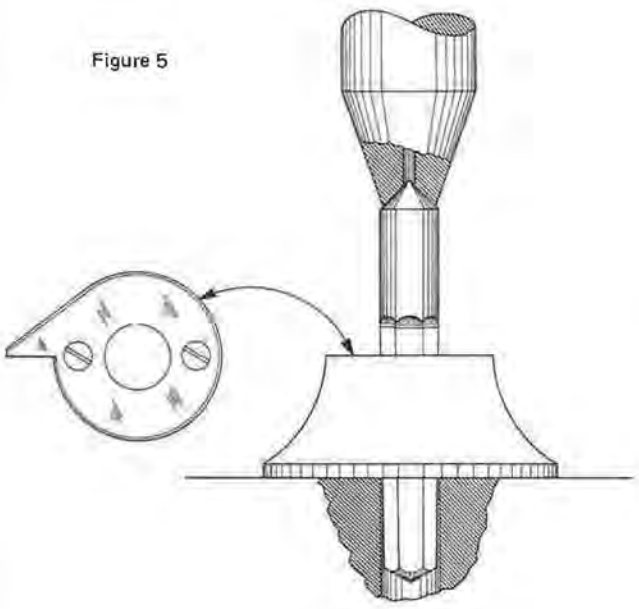
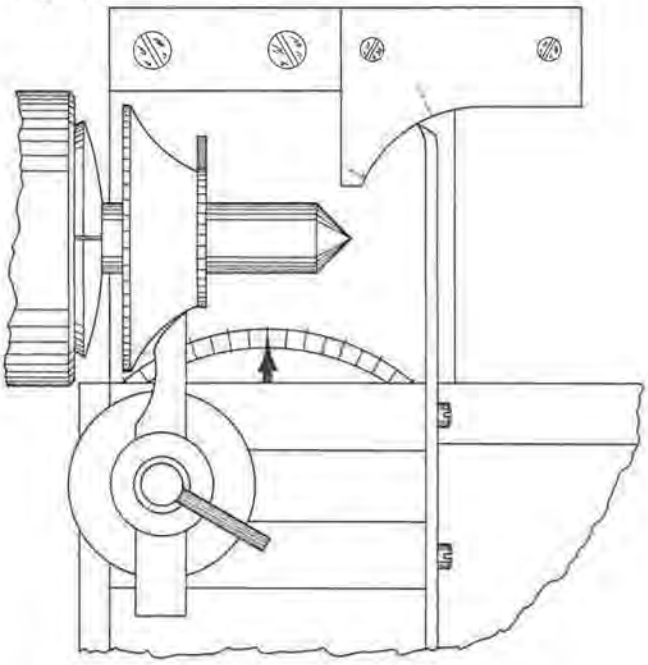


Figure 6



fusee, one must know how high the fusee cone is and how many turns are needed on the fusee. Example:

Let us suppose that the fusee needs to make 5 turns and the height of the fusee is 4.16mm. Then:

$$\text{Pitch} = \frac{4.16 \text{ height of cone}}{5 \text{ turns}} = .832\text{mm}$$

$$\text{Threads per centimeter} = \frac{10}{.832} = 12.01 \text{ or } 12$$

Let us say that the slide rest has a metric lead screw with 10 threads per centimeter. Then:

$$\frac{\text{Threads on lead screw } 10}{\text{Threads to be cut } \quad 12} = \text{Change Gears}$$

By multiplying the 10 and the 12 by the same number, we will obtain change gears to cut the thread needed. Example:

$$\frac{10 \times 3 = 30}{12 \times 3 = 36}$$

The 30 tooth gear goes on the lathe spindle and the 36 tooth gear goes on the slide rest lead screw stud of the attachment.

When one desires to use a slide rest which has an inch lead screw, then threads per inch would be cut. The following is an example of calculating for change gears when the fusee steps are cut with threads per inch.

Height of fusee cone = .164 inches

Turns of fusee = 5

$$\text{Pitch of thread} = \frac{.164}{5} = .0328$$

$$\text{Threads per inch} = \frac{1.000}{.0328} = 30.48$$

Therefore, we would use 30 threads per inch since 30.48 is closer to 30 than to 31 and 30 is a good even number to use. The lead screw in an inch slide rest for the watchmakers lathe has 40 threads per inch. Then:

$$\frac{\text{Lead screw } 40}{\text{Threads to be cut } 30} = \text{Change gears needed}$$

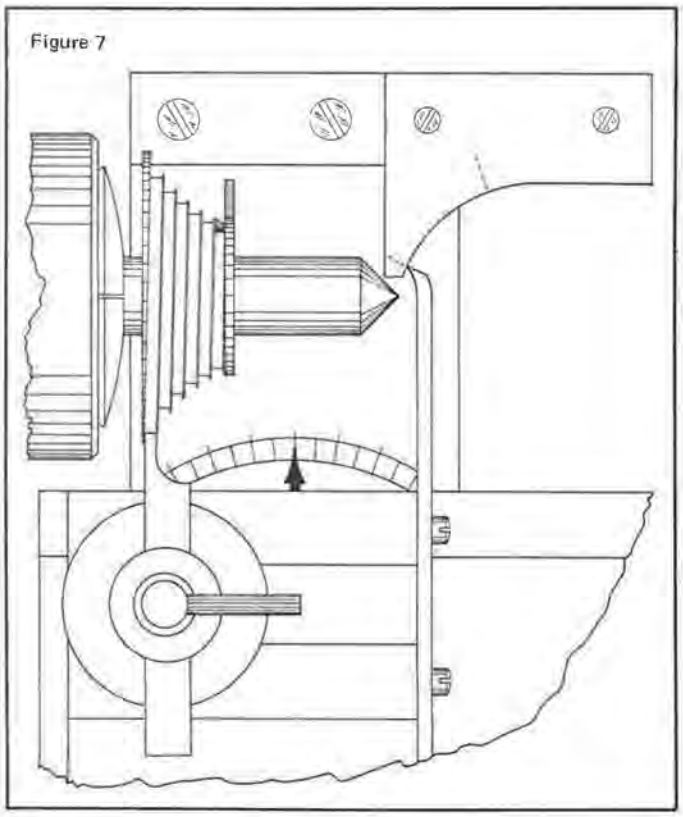
By multiplying these numbers by the same number, other gears will be found that will work also. The 40 gear would go on the lathe spindle and the 30 gear would go on the lead screw stud. An intermediate gear large enough to connect the two gears would be used. Note: One intermediate gear allows a left hand thread to be cut which is what the fusee has.

CUTTING THE CHAIN GROOVE

Figure 7 shows the groove being cut around the fusee cone. Note that the cutter is made similar to a cut-off tool. The cutter cuts on its two sides as well as its point. It is very important that these three cutting edges are sharp smooth. The width of the cutter is such that it allows for a thin flange on the edge of each step. This flange is used for guiding the fusee chain and to keep the chain in alignment on the steps. The width of this flange is usually .10 to .15mm. A very thin watch might have a flange of .10mm whereas a thicker watch might have a flange of .15mm. The width of the cutter to cut the groove would be equal to the pitch minus the width of the flange. For example:

Pitch .832 – .15mm = .682 = width of cutter

Figure 7



To cut the groove, the cutter is positioned in the tool post of the slide rest. Make sure the cutter is set square with the work and that the cutting edge is on center with the lathe center. Also, make sure the fusee arbor is chucked tightly in the lathe and the fusee blank runs true. Note: The tailstock spindle can be used to support the end of the fusee arbor during the making of the fusee. Then the belt is removed from the lathe pulley. Next, the thread cutting attachment is connected to the lead screw of the slide rest. The cutter is positioned for the first cut, and the tracer bar is positioned at the starting point on the curve of the template. To start the groove, the headstock is turned by hand, then after the groove has been cut to a shallow depth, the completion of the groove can be done by turning the handle on the lead screw of the longitudinal slide while taking very light cuts with the cutter. Note: The cut of the groove ends at the top of the fusee cone by the finger on the stop piece. It takes several passes down the groove to cut the groove to the final depth. The groove should be cut to a depth which is about one-half the width of the chain; that is, the flange on the groove should be such a height that only one-half of the width of the chain is visible. This depth is usually between .20mm and .30mm.

After the groove has been cut, it will be noted that the edge of the flange is beveled or takes on the curve of the fusee. This edge should be squared up after the groove has been cut. This can be done by shifting the cutter on the slide rest so the flange is centered on the cutter. Then run the cutter down the edge of the flange the same way the groove was cut to square up the edge of the flange. Note: It is very important when doing this operation that the height of the cutter is adjusted so the cutting edge is on center with the lathe center and the end of the tracer bar is at the starting point on the template when the cutter is at the starting point at the base of the fusee.

"Making a Fusee" will continue next month.

Old Watches

Charles Cleves

DIALS

How They Affect Value

On vintage wristwatches the dials are becoming increasingly more important as the market matures. I know I have bought several watches because of my first impression of the dial. Many collectors fall in love with a watch and buy it even before they closely examine the movement, the reason being a nice, attractive original looking dial. Some of the more prominent collectors are only collecting watches with the original or an original looking, properly aged finish. The more important the watch is the more important the dial becomes. On a $50,000 watch the dial finish can make a $5,000 difference. If you have a watch and you are not sure whether you should have the dial refinished, then don't. You might actually be taking away value by refinishing the dial. If it's to the point where you say this dial looks terrible, then have it refinished. An extremely poor finish gives the buyer something to knock when you go to sell the watch.

One factor that led to more emphasis being placed on the dial is the recasing of movements and forging of cases. There was an extremely large quantity of wristwatches scrapped in both 1932 and 1981, not to mention the many in between these years. This leaves a surplus of good movements. There are many unscrupulous dealers and collectors recasing the better movements in less valuable cases. While there is nothing wrong with this, they don't stop here. Sometimes casemarks are removed and other times marks are added, the main intent being to deceive someone into thinking the watch is all original. Many times the dial will not match the case into which it is recased. Thus, a new dial has to be made or the old one altered and refinished. Having the original finish on the dial eliminates many doubts a person has as to the complete originality; that is, most of the time. Some of the Europeans are manufacturing Rolex doctors watch cases exactly like the originals using equipment similar to what the original cases were made with. This makes them nearly impossible to tell from the genuine. They buy movements with old, original-finish dials and fit them perfectly. This is starting to make all of them fall in price. How many other cases can they or will they duplicate exactly in the future? How many are they duplicating already that we don't know about?

Another factor that led to more emphasis on the dial is that on some of the high-grade watches the dials are so finely done that none of the dial companies can refinish them properly. Rolex dials with raised permanent markers are a good example of this. The sunburst pattern under the finish takes special machinery to prepare the dial before it is plated. Even the wording on the dial is so finely done, much finer and

Figure 1

Figure 2

Figure 3

precise than the dial refinishing companies can do. Most of the 1960-to-present Rolex watches are reconditioned and eventually sold to the public. Watches with poor finish or badly refinished dials are not very saleable. Many replacement dials from the early sixties are no longer available from Rolex. This makes it very important for the dial to be nice.

Because the dial and hands are the most noticeable part of a wristwatch, companies have decorated them by adding diamonds, mystery hands, cloisonne dials, digital dials, and other frills. Figure 1 shows a platinum Hamilton wristwatch with a full diamond dial. This particular case style is found with Bulova, Elgin, Longines, and other movements. These cases were made by a company that bought movements from various manufacturers and added diamond dials and platinum cases. Although collectors usually do not like watches that are not in genuine cases, most collectors like these particular ones. Platinum men's wristwatches are very much in demand since there weren't that many made. This case style was also made in white, pink, and occasionally yellow-gold. In platinum, watches start around $800. The gold models start at $500.

Figure 2 shows a Longines watch with a mystery dial. Not all mystery watches have diamonds on them, but this one does. The dial is two pieces. The center of the dial takes the place of the hour hand. In fact, the hour wheel is mounted permanently to the center of the dial. The minute hand is either a clear disc or sometimes a regular hand. On this watch the minute hand is a clear disc with a triangular shaped arrow for the hand. The most collectable of the mystery watches are the ones marked LeCoultre and Vacheron & Constantine. They usually have a bar with three diamonds for each number. These watches sell for $750 and up. The ones by Longines are not as valuable as this.

Cloisonne dials are another type. These are not very common as they were not mass produced. One that I have is of a peacock. The dial is made by soldering gold wire in the shape of the peacock on the sterling silver base. The enameling or fine glass bead is then heated to fill in the design. The fine gold wire outlines the different figures so that is separates the colors. Enameling, like engraving, is becoming a lost art. Dials like this are very hard to repair so be careful not to bend or put extra pressure on these dials when handling them. These are becoming very valuable, especially ones made by Patek Philippe and other high-grade watch companies.

Figure 3 shows a digital dial from the 1950s. Instead of having hands, the disc is placed on the hour wheel and the disc for the minute hand. The inner part of the minute disc is clear so that the hour disc can be seen through it. Some watches have all disc and no hands, while others only have a disc behind the dial for the second hand. These early digital watches are very interesting and make a nice addition to any collection. They are not really scarce and can be found under $200 at all the watch shows.

The dials I like the best are the 1920s sterling silver dials with applied numbers and enamel inlaid minute track and company. Some of the early Gruen dials were made this way. These dials are a real work of art. Hamilton also made beautiful dials with gold applied numbers but the minute track and name were painted on.

Sometimes (being watchmakers) we tend to place too much emphasis on the movement of a watch and overlook the beauty of the case and dial. The collectors aren't as concerned with what they cannot see as long as it is not too bad. But when selling collectable watches the dial makes a big difference.

How to Refinish an Antique Wooden Clock Cabinet

by

Mike Di Guido

Have you ever seen a clock cabinet with its finish in extremely poor condition, but the underlying wood is in good condition? If you have, you may have pondered what to do with it. Here is a method I have used very effectively over the years on clock cabinets and other small pieces of furniture. The process involves a hand-rubbed, oil-resin finish. Most clock cabinets of yesteryear have an opaque lacquer finish. This does not mean that the underlying wood is a piece of junk with an opaque finish in order to cover up a multitude of sins. Rather, it was purely an economic consideration. Cabinetmakers could spray lacquer each piece in a few minutes on an assembly line basis, thereby holding costs to a minimum. Can you imagine the difference in cost if each piece were individually hand rubbed over a period of several days? Once you strip the lacquer off one of these old cabinets, you may be quite surprised to see a very handsomely grained piece of wood. With the *clear* oil-resin finish, you'll have many years of visual enjoyment and pride in your diligent workmanship.

Stripping the Old Finish

Before you get started, withdraw the movement, dial face, bezel and glass, hinges, and any other cabinet hardware. Use a good quality paint/varnish/epoxy remover. Work in a well-ventilated area, as the fumes can be harmful in a poorly ventilated room. You should also consider using a pair of rubber gloves because the paint remover is caustic and can annihilate your skin. Always read the directions and recommendations on the can! This is a messy job, so have plenty of newspaper and old rags on hand. Apply the paint remover with a brush over the entire piece and let it set for 10-15 minutes or so in order for the remover to penetrate the finish.

Now comes the "fun." Don't forget–rubber gloves! A variety of household tools come in handy here. Since my wife is a nurse, I seem to have an unending supply of tongue depressors. You know the kind–the wooden ones the doctor sticks in your mouth and asks you to say "ahhh." These work great for scraping the gunk you developed from the larger flat surfaces. If you don't have tongue depressors, use a smooth piece of plastic such as one designed for scraping ice off of automobile windshields. Almost anything can be used here except metal tools. Don't use your wife's spatula or a putty knife; the risk of gouging or scratching the wood is too great. Even with the tongue depressors or plastic, work very carefully to avoid scratching the wood. In the absence of any tools, and assuming you have 90,000 rags, use them to take the gunk off. If you use rags, then you can be fairly certain you won't gouge the wood.

After this first application and scraping, you'll probably wonder why you ever started the project. The piece will look rather awful at this point, but you've only just begun! It will take several applications of remover and scraping. If you're of Italian extraction, as I am, you may use a few well-chosen Italian curse words here. Not that it helps remove the old finish, but it seems to help blow off the steam and get you back on track. Eventually you'll get to a point where the scraping tools will no longer be used. Now you *must* go to the use of rags, although another good tool to use is the Teflon® or plastic dish/pan scrapers. These items will help you loosen the stubborn areas.

This is all fine for the flat surfaces, but what about the deep carvings and crevices that are a part of some clock cabinets? Toothbrushes work well here. Just don't try to use them on your teeth after working with the paint remover. It may aid in tartar removal but may also remove the gums and

certainly won't taste as nice as toothpaste. Another handy little item is the Q-Tip (cotton swab) which is well suited for getting into those hard-to-reach places and deep carvings. Toothpicks also work well. Be careful, however, that you don't scratch the wood with its point. Once you've worked the piece over and removed all the old finish, you may be quite surprised to see that the color tone of the piece is quite good.

You may have noticed that I expressly omitted the use of steel wool in the stripping process. Although many people advocate the use of steel wool, I choose not to use it. Its use tends to have the same effect as sandpaper and washes out the color. Without its use, there's a good chance you won't have to restain the piece. If the cabinet has a few dings and dents in the wood, leave them there. After all, you're working with an antique. The idea is to refinish the piece while maintaining its integrity.

If you find that the color is not to your satisfaction, then restain. Before you apply stain, it is a good idea to saturate a clean rag with paint thinner and work over the entire piece. Avoid rubbing hard in one spot as this will surely result in a blotchy appearance. Apply the stain (walnut, mahogany, etc.) with a clean brush over the entire surface. Let it stand for just a few minutes in order for the stain to penetrate the wood, but don't allow the stain to dry on the wood. Use a clean rag to wipe the piece down. You should have no "wet spots" on the wood after the wipe-down.

Applying the New Finish

Before you apply the new finish, be sure you have removed *all* the old finish and are down to the wood. If you've restained the piece, allow it to stand for 24 hours before starting the new finish. In the meantime, you can mix the following formula:

2 parts varnish
1 part linseed oil
3 parts paint thinner

Be sure to use good quality products for the formula. Remember that the kind of varnish you use will determine the final appearance of the piece. If you want a very shiny finish, then use a high gloss varnish. If your desire is for a dull or matte finish, then use a satin varnish. My personal preference is for the satin finish.

Incidentally, I have found that in a tightly sealed container, and stored in a cool dark place, shelf life on the formula could be up to one year. Before you jump into applying the formula, it's a good idea to remove all rings from your fingers so as not to scratch the wood. (You may wish to work out of sight of your spouse as she or he may take a dim view of you removing your wedding band.) Apply the formula to the entire piece with a brush. Don't be stingy with the formula–just flood it on! Let it stand for about 15 minutes; then comes the "real fun." Using the palms of your hands and the balls of your fingertips, start rubbing over the entire piece. Be careful not to scratch the wood with your fingernails. Keep rubbing and rubbing and rubbing! It's not a bad idea to wipe the excess formula off your hands frequently, as this will speed up the drying of the wood. If your hands become tacky as you work the piece, apply a small amount of paint thinner to the hands in order to cut it.

As you work the piece over and over, you'll start to see that it is actually drying as you rub. This is the desired effect, and you want to rub it until it's virtually dry to the touch. What's happening here is that you're rubbing the finish right into the wood. You're building up the finish from the inside out, as opposed to merely laying varnish on the wood and allowing it to dry in the air. A couple of benefits of the hand-rubbed finish is that you have no brushstrokes in the finish, and because you've rubbed it virtually dry, there is little or no concern of dust particles settling on it. Now let it set for at least 24 hours before the next application.

A word of caution here: Don't just leave the work and come back to it 24 hours later. You should check it frequently for several hours after rubbing it down to an "almost" dry state. Chances are better than ever that some small drips may occur here and there, especially from deep carvings. Scrutinize the piece very carefully in a well-lighted area. With your hands now washed and dried, remove any drips that seep out of corners and carvings. Use the ball of your fingertip to swipe across the seepage. The *trick* is not to let the drip dry before you get to it. Here again, the Q-Tip will come in handy if covered with a lint-free rag. Very gently go into the deep carvings to blot the excess formula.

Well, I didn't say this was going to be a quick and easy job! The results, however, are well worth the time and effort. You'll find that one application does not make it; after the 24-hour waiting period, give the piece a second application. Again, flood the entire surface with a brush. Give it a chance to soak in, and begin the rubbing again. Use some caution with handling the piece between applications. Although it's fairly dry, handle it in such a manner so as not to get finger smudges on the fresh finish. As you go through each application, you'll see where more formula is needed. Avoid trying "spot" applications. By this I mean don't apply formula to only the area that seems to call for more; rather, flood the entire piece each time and rub it down. You'll eventually get to the point where the wood will not take any more finish. This could be as few as three applications or as much as five or six applications. Just keep doing it until you achieve the desired results. When the finishing process is concluded, allow several days for it to cure before replacing the movement and hardware. Have fun!

THE PICKLE BARREL

Marshall F. Richmond, CMW

BASIC JEWELRY REPAIR

FITTING STONES IN SETTINGS

Stones can be altered in size to fit settings, or settings can be altered in size and shape to fit stones. There are, of course, limitations due to the size and shape of the stone as well as the size and shape of the setting. Most everyone who does extensive jewelry work knows that settings can be bought from your supplier to fit any standard cut stone, but many stones are not standard cut, so we can be confronted with a problem.

If the stone is mounted and the setting worn it is probably more practical to repair or rebuild it than to try and find a replacement, if your customer approves. Stone specialty houses can cut most any stone to shape and size if you send them a sample (like the broken stone if there are enough pieces to identify the cut, shape, and size). This often takes from three to six weeks and can be quite expensive. When ordering stones, if you can order by size, cut, etc., it is less expensive, even in a standard size and cut, than if a sample is sent because there is an added service charge for matching.

Most standard cut stones fall in eight categories: antique, cabochon, cushion, navette, octagon, oval, pear, and round. Stones such as bloodstone, synthetic ruby, blue spinel, black onyx, and many others are either round, square, rectangular, oval, or octagonal, but they are flat on top and usually flat on the bottom. Many are drilled for emblems or diamond settings. Some are drilled with two holes, one for a diamond setting and the other for an emblem or an initial. Many of these are standard stock sizes, but as holes are often drilled in different locations or of different sizes, a special order can be required. This is to make sure the holes are drilled in the correct locations and of the correct diameter.

A good jewelry repairman is usually versatile enough that if the holes are not the right diameter he can either change the tubes on the emblems or diamond settings to fit or enlarge the hole using a diamond-charged bur. Many stones will vary a few hundredths of a millimeter, so when the old stone is a round 3½mm and you order it, it may come in 3.40mm or a 3.60mm—so something must be compensated in the setting to make a good fit. If the stone is too large, the seat can be enlarged with a setting bur. If too small, however, it may be necessary to hard solder some metal in the setting and then cut the correct size seat for the stone.

Any standard cut stone regardless of size or shape could vary a few hundredths of a millimeter in size. Stone settings in finger rings will probably be more varied than in any other piece of jewelry and you will more than likely have more finger rings to repair than any other type of jewelry. In men's rings with flat stones you will find full bezel settings. In square and rectangular stones the corners may be bezeled or double pronged. Although most round stones are prong or bead set, round flat or cabochon stones are often bezel set. In my opinion, bezel setting is the most secure way to mount stones of any kind, if it is practical. In colored stones an octagon stone is rectangular with the corners cut off forming eight sides, but a diamond the same shape is called an emerald cut. A navette colored stone is pointed on both ends, but a diamond of the same shape is called a marquise cut.

With all the different shapes and sizes of stones and different types and sizes of settings it requires a very versatile craftsman to be able to replace broken or missing stones and get a secure fit in the old setting. With prong-type settings, the complete setting can be removed and replaced with a new one that is available from the material houses, or if not worn too badly, can be repaired or altered. Bezels likewise can be replaced or altered, or a new bezel can be made by hand and hard soldered to the piece of jewelry. Material or findings suppliers usually stock bezels to fit most standard cut stones that customarily are bezel set. Most square, oval, rectangular, or round stones that are flat on the bottom have a tapered edge with the bottom of the edge being slightly larger than the top. This means that a bezel in which the stone sets snugly can be firmly set by merely burnishing the edge of the bezel over the tapered edge of the stone. Being burnished tight against the stone, the edge can then be filed and polished to make a very neat finish and not cover up any of the face of the stone. Usually when a replacement on this type of stone is needed, it will possibly be slightly larger or smaller than the one to be replaced. If it is slightly larger, first determine if the bezel is thick enough to remove a little metal all around the inside to let the stone fit. This metal can be removed with a flat bottom hand graver. If this would make the bezel too thin, the next alternative would be to see if the size of the stone could be reduced enough to fit.

Stones such as onyx, bloodstone, jade, turquoise, or mother of pearl can be reduced by using a slow turning wet glass grinding wheel such as a watch crystal grinder, if lapidary equipment is not available. I have also used my flex-shaft tool with a dental separating disc, which is probably a grit of aluminum oxide, and ground a little from the outside edge, then polished with white tripoli on a hard felt buff wheel. Synthetic ruby or sapphire as well as other synthetic stones which are harder stones would require lapidary equipment or a diamond lap to reduce the size. On one occasion, I had a rectangular flat cut drilled onyx to replace that was 12 x 10. Having an onyx the same shape and thickness with the correct diameter hole drilled in the right location that was 14 x 12, I removed 1mm from each side with my wet crystal grinder and completed the repair. This was a job that was a special rush order, so I gained some experience instead of a good hourly rate of pay.

Normally if the stone was not in stock, I would place an order and wait for a week or two for delivery. Another alternative is to make and install a new bezel to fit or install a factory-made bezel, then set the stone and finish it.

PRONG SETTINGS

In previous articles, I have explained how to replace bezels and prongs which can be done either for repair or replacement of worn or broken settings, or for relocating them for a different size stone. Prong settings are the most versatile, especially if they are four, six, or eight prong tiffany type settings with long prongs. Often they are long enough that they can be spread to accommodate a larger size stone or closed to take a smaller stone. In many cases where the tips of the prongs are worn the stone can be lowered, giving all new metal over the stone and making the setting even stronger than when it was new. Because the prongs are shorter they will have more strength. Prongs over flat bottom round or cabochon stones can be easily replaced using round wire and hard soldering it to the base of the setting in any place necessary. After each solder joint the wire can be cut to length and then soldered to the next location until all the prongs have been put in place to fit the stone.

Bead set stones in flat settings are usually round, faceted stones. These are generally diamonds, although this system has been used for other round stones. If a stone is a little larger than the one being replaced, this makes it easier, for with a setting bur the size of the replacement stone a new seat can be cut. Since the stone is a little larger, there should be metal available for forming the beads by first pushing the metal toward the stone and then raising it over the edge with a round bottom graver. Then a beading tool of the correctly chosen size will form a bead tightly over the edge of the stone. When all the beads are tight and secure, finishing it is a matter of using a sharp, flat bottom hand graver with the bottom polished to a mirror finish and bright-cutting away the excess metal around the beads and the edge of the stone. As the setting is square, ridges can be formed and millgrained to make a very attractive setting. Polishing is only necessary to remove any excess rough spots that can catch on clothing or to polish the rest of the piece of jewelry to make it look like new.

One type of repair that I have often encountered is a ladies' antique ring with several small stones, 2mm or smaller forming a round or oval cluster. These antique gold mountings seem to come in all colors that gold can be made: yellow, pink, white, or even green or in combinations of two or more of these colors. The small stones have been opal, jade, ruby, garnet, emerald, diamond, or others. Some are cabochon cut, some are faceted, and some have no uniform shape. The settings are three or four prong settings made in the base of the cluster. These are probably stamped in the base or maybe some castings, but they are very delicate and the stones often not very secure.

Due to sentimental or antique value people want missing stones replaced, so I have always stocked as many small stones of this type as I felt the repair jobs would support. Often one of these rings will come in with a stone missing and I will not have the size because the original was not a standard size. If it is opal, jade, garnet, or one of the softer stones, I find the closest that I have in something slightly larger, mount it on the end of a brass rod slightly smaller than the finished diameter should be with stick shellac, and grind it to the correct diameter on a wet glass grinding wheel. Then I polish it where it was ground, using white tripoli on a hard felt wheel on the polishing motor. To remove the stone from the brass rod, alcohol will quickly dissolve the stick shellac, then it is ready to set.

When repair of the setting or settings is necessary, unless the stones in the cluster are diamonds or stones that will take heat, they must be removed to allow heat to be used in replacing any settings or prongs. Many antique earrings are also made this way but the problem here is not as difficult because earrings are not subjected to the extremely hard wear that finger rings are. Most repairs on the earrings are caused by accident, like being dropped or stepped on.

Repairs on earrings need not be made as durable as on finger rings. In making repairs in this type of ring or cluster setting, all the basic rules of stone setting seem to be null and void, as these stones are poorly set and prongs cannot be easily replaced due to the other stones that will not stand heat. This leaves us using any available metal that we can get over the edge of the stone to hold it once it is in place. Often there is available metal next to where the broken prong was that can be picked up with a sharp graver and pushed over the edge of the stone. When this is done the prongs will not be evenly spaced but if the originals are closely inspected many of them are set with the prongs unevenly spaced. Sometimes in the same ring some of the stones will be set with four prongs, some with three, and some with only two. In repairing these rings and settings it requires sheer ingenuity, and nothing else but hard work.

PEARLS

Pearls are often coming loose or getting completely out of their settings and even lost. These are easy repairs, requiring the least amount of skill of any stone setting operation. Some are set in four, six or eight prong settings, some merely cemented to a cup, some half drilled and set on a post with cement. The prong set are the hardest to hold because the pearls are perfectly round, and a solid bump will often loosen the prongs enough to let the pearl turn in the setting. With the introduction of Aron-Alpha® cement, this is easy to correct; after retightening the pearl apply a little to the base of the setting where it makes contact with the pearl. This will hold it in place and not be visible to the naked eye.

For replacement, pearls are available in millimeter sizes from two to eight in half-drilled, smooth, or full-drilled for stringing. The half-drilled are for replacement on pegs with cement. When I get a setting that does not have a peg, I gold solder a piece of .8mm round wire to the center of the cup and cut it off, leaving protruding one half the diameter of the pearl to be used. If a pearl is 4mm in diameter, I leave the peg

(Please turn to page 42)

JIDA and AJMA Co-Convention

PHOENIX, AZ

The Pointe at Squaw Peak in Phoenix, AZ was the site of the Co-Convention of the Jewelry Industry Distributors Association (JIDA) and the American Jewelry Marketing Association (AJMA). The convention was held March 23-27, 1988. More than 250 delegates and spouses from JIDA and AJMA attended the five-day convention. Programs included a presentation by Bruce Merrifield on "Selling Skills," Merchandise Day, business seminars, and conferences. The 1988 "Man of the Year" award was presented to Max Sussman (of Mormac/Kestenmade). Given by JIDA since 1960, this Award recognizes long-term service and dedication to the Association.

Robert E. Mahar, President of Jewelry Industry Distributors Association.

Ron Chambers, President of American Jewelry Marketing Association.

Gene Kelton, Citizen Watch Company of America, and Denis Gaber, Ray Gaber Company.

Karl Esslinger of Esslinger & Co., and Jean-Louis Miserez of ETA, SA.

John Hager and Joseph Presti of Vibrograf USA, and Wayne Moengen of Jewelmont Corporation.

Patrick Cassedy of Cas-Ker Company; Gary Theriault of George H. Fuller & Son Company, Inc.

Jonathan Frankfort of CoServ Material Sales.

William Miller and Howard Goldberg of House of Watchbands; Harold Perlman of American Perfit Crystal Corporation.

Ira H. Silver, AWB Panasonic; Henry Livesay, Livesay's, Inc.; Tom Corbett, AWB Panasonic; and Robert Mahar, Mahar & Engstrom.

Tony Thompson and Ian Irving of Maxell Corp.

Angelo Zappala, CoServ Material Sales, and Roger Borel, Jules Borel & Company.

Ron Myers of Sy Kessler/Renata US.

Wayne Moengen, Jewelmont Corporation, and Greg Zanoni of Zantech, Inc.

Candida Johnson, Gary Alziebler, Rose Niedorf–J.J. Kagan & Co., Inc.

O.Z. Collins of Blankinship-Porter Company, and Bud Wright of Newall Manufacturing.

New Products/News in the Trade

CAS-KER INTRODUCES NEW SINK TRAP

A new and unique sink trap is now available from the Cas-Ker Company. The trap prevents clogging and eliminates the loss of valuable stones and precious metals. Constructed of corrosion-free PVC, the unique design only catches dense items and prevents odors. Maintenance and cleaning can be done without any mess or the use of tools or buckets. The trap is easy to install—it replaces a conventional sink trap. It traps plaster, gold, and small stones without the use of liners or disposable buckets. Its price is $55.25.

For more information, contact: **Cas-Ker Co., 2121 Spring Grove Ave., Cincinnati, OH 45214; (513) 241-7073.**

KASSOY'S NEW HEAVY DUTY ULTRASONIC PRO-LINE

Several models of varying capacities make up the new ultrasonic line of heavy duty cleaners from Kassoy. All units have stainless steel tanks and solid state circuitry for longer life, one piece assembly, and tank covers. There are models to fit every cleaning need, ranging from 16 oz. capacity to the super large 7-gallon unit. Larger units are equipped with heaters and timers. All models carry a one-year warranty. Baskets and ring racks are available. The model shown is CL40, 1 qt. capacity, at $175.00.

Kassoy also offers Dyna-Mighty, a powerful but gentle ultrasonic cleaning solution concentrate, at the price of $6.95 per quart.

For more information contact: **KASSOY, 28 W. 47th St., New York, NY 10036; or call toll free 1-800-4-KASSOY, in New York State call 1-212-719-2290.**

FROM GENTRY COLLECTION: ELEGANT TIMEPIECE WITH MOON-PHASE INDICATOR

Seiko has created a timepiece that is at once simple and elegant, featuring a handsome moon-phase indicator.

A classic white dial is accented with fine concentric circles, complementing a moon-phase indicator at the 6 o'clock position. A date display marks 12 o'clock. This timepiece is completed by a distinctive honey brown leather strap.

The Seiko Gentry Collection is available through the nationwide network of authorized Seiko distributors.

VOGUE'S NEW FLASH COLLECTION

Vogue Watchstrap Creations has announced their new Flash Collection of replacement watch straps for 1988. Designed to fit today's most popular fashion watches, the Flash Collection emphasizes color and texture.

Blue crocodile grain leather, genuine braided calfskin, berry red calf embossed in a horizontal stripe or cross hatched weave pattern, smooth white leather accented with navy blue bows are just a few of the styles that makeup the collection. All styles are genuine leather and come packaged in an atrractive pre-priced display box which fits into the triangular Flash "Countertop Boutique" display case. Each box carries the John Weitz designer name. These straps are designed to retail for $4.95, $5.95, or $6.95.

For more information, contact **Vogue Watchstrap Creations at (212) 925-1050.**

PICKLE BARREL

(Continued from page 39)

protruding 2mm. After the peg has been cut to proper length, the one half-drilled pearl can be cemented on using Aron-Alpha cement. This is almost a guarantee of no future problems with this pearl. To remove this after it has been put on with Aron-Alpha cement, most recommend using acetone. However, having tried this with no success after soaking for two days, I tried something on my own. I held the pearl in my fingers and applied heat to the base of the setting using a very small flame with the little torch and it became free before the pearl got warm enough for me to feel it. The purpose of holding it in my fingers was so that if I felt the heat before the pearl loosened, I could remove the heat before any damage could be done to it. It seems that heat deteriorates the strength of Aron-Alpha or even epoxy cements; and even after they are cool, stones are easily removed. I have since tried this on turquoise, opal, and jade with success, but in some cases it could be risky—a valuable stone could be damaged or even a burned finger suffered. Remember that when experimenting with something new, even though it has been thoroughly explained, there is still risk of damage. Again I would like to remind you to carefully analyze any repair before starting and also any step being made in the repair. *An ounce of prevention is worth a pound of cure* is well worth remembering.

In the repair of jewelry there are many options available, so even though you may get in trouble on the first try, there is always a way to overcome the problem by switching to another approach. If these options are carefully considered before starting the repair and something does not work on the first try, you should immediately know what to do by using another approach.

In the next article, we will discuss devices and materials for fastening, binding, and bonding.

S. LA ROSE, INC. BUYS INVENTORIES OF MARSHALL-SWARTCHILD

S. LaRose, Inc. of Greensboro, NC recently purchased the inventories only of Marshall-Swartchild & Co. (they did not purchase Accounts Payable or Accounts Receivable). Marshall-Swartchild had been an active factor in the watch and clock material, tool and supply business since 1871.

The Dallas, TX, Houston, TX, and main Chicago offices have all been closed and the inventories have been moved to Greensboro, NC.

The Marshall-Swartchild inventory will be combined with those of S. LaRose, a firm that is now in its 52nd year in the watch and clock material, tool and supply business, making S. LaRose one of the largest horological supply companies in the world.

For more information, contact: **S. LaRose, Inc., 234 Commerce Pl., Greensboro, NC 27420; (919) 275-0462.**

AMERICA'S RECENT WOSTEP GRADUATES

Four Americans were among the 11 students to graduate from the last WOSTEP class in Neuchatel, Switzerland. The class included students from Scotland, India, Australia, England, and the Americas (Canada and the U.S.). The American graduates and their school officials are: A. Simonin, Director of WOSTEP; Jean-Guy Lalonde of Canada; Julia Sheppard of Portland, OR; Dale Danielson of Seattle, WA; Ray McLeod of Fairbanks, AK; and R. Frene, Chairman of WOSTEP. (Student Ray McLeod was sponsored by the AWI ELM Trust.)

A new Bulletin, *WOSTEP Happening* has been published by WOSTEP. Those who are former WOSTEP students can receive this bulletin by sending their current addresses to the school. The bulletin is designed to keep former students updated on WOSTEP happenings, such as the new course available to former students on complicated watches, and the recent WOSTEP reunions held in Seattle, WA and London, England.

The first session of the 1988 WOSTEP course is now under way, but there are still a few openings for the second course to be held from July-November, 1988. Prospective students should contact: **A. Simonin, Director, WOSTEP, Rue des Tunnels 1, 2006 Neuchatel, Switzerland.**

WOSTEP Session (left to right): A Simonin, director of WOSTEP; Jean-Guy Lalonde, Canada; Julia Sheppard, Portland, OR; Dale Danielson, Seattle, WA; Ray McLeod, Fairbanks, AK; R. Frene, chairman of WOSTEP.

TIME TO REMEMBER

Bulova Watch Company, Inc. honored U.S. Olympic gold-and-bronze medal-winning speedskater Bonnie Blair at a luncheon held at the Regency Hotel in Manhattan. Blair, who just returned from Holland where she won the overall 1987-88 World Cup Title in speedskating, received the first Bulova Olympic watch from Bulova president, Andrew Tisch. In his welcoming remarks, Tisch referred to Blair as one who embodies the true Olympic Spirit as well as the great American Spirit. "Your achievements will remain smong our finest moments of the 1988 Olympics. We salute you and thank you for making our hopes into realities," Tisch added.

Herbert C. Hofmann, Bulova's chief operating officer, presented a Hoya Crystal Clock by Bulova to Blair as a momento of the occasion. Bonnie and her mother, Eleanor, were also given Bulova/Olympic Jackets by Tisch and Hofmann.

The Olympic Games fostered a special bond between Bulova and Bonnie Blair. Bulova was the first company to sponsor Blair in advertising. Also, Blair was the subject of the "fast-close" ad to run in *Time* magazine. In its role as the official watch supplier to the 1988 U.S. Olympic Team, Bulova Watch Company will present each of our country's 1500 athletes with these specially-designed Bulova watches to commemorate their participation in the 1988 Winter and Summer Olympic Games.

Affiliate Chapter Column

Thomas H. White

WHY ARE FIRE TRUCKS RED?

Fire trucks have four wheels and eight firefighters, and four plus eight equals twelve. There are twelve inches in a foot. A foot is a ruler. Queen Elizabeth is a ruler, and the Queen Elizabeth is one of the largest ships on the Seven Seas. Seas have fish. Fish have fins. The Finns fought the Russians. The Russians are red. Fire trucks are always rushin! Therefore, fire trucks are usually red!

If you think this is wild, you ought to hear some of our members or ex-members and friends trying to explain why they are not attending some or all of our guild meetings or the conventions. We all know how hard it is to make a living these days. Up in the morning, then hustle and bustle all day. A little break at noon for a bite to eat, then back to work until it's time to go home. After supper and repairing a few things around the house, it's time to help one of the little ones with their math, history, and maybe spelling. (Isn't is amazing how one's own spelling, math and history skills suddenly improve!) Then off to bed for the night.

The next night a meeting has been arranged to discuss the poor attendance at guild meetings. There are those that will remember when the attendance was three times what is is today. However, we certainly are much busier these days! Presently, we have some of the old members still attending a majority of the meetings, while others have just begun to attend. Most of us that come to the meetings are interested in our trade. Unfortunately, it is much easier to receive than to give. How much can we drain from our trade without replenishing our livelihood? In other words, how often can we draw from the well before it goes dry?

How can EVERYONE work together to replenish our trade? Here are 15 possible ways:

1. Start a project in your shop or home and make slides of it before you begin. Then, as you progress take step-by-step pictures of the way you complete the project. The first time you do this you might not do as well as you expected, but the more you try the better you will get. Then bring the projects to the meetings to show others what can be accomplished.

2. Let one of your group demonstrate a technique such as how to go about installing a quartz movement into an old case. When one of your own group shares his knowledge, it will inspire others to do the same!

3. Someone can describe how they schedule their daily shop activities in order to provide the best advantage for repairs and sales.

4. Have a watchmaker present a program on watch case repair.

5. Find someone in the guild that can bring you up-to-date on diamonds and gemstones.

6. Another interesting program could be instruction in the making of tools versus buying them.

7. Have you purchased a new expensive tool for making parts? Present a program on its use.

8. Talk about the way a computer can be used in a shop or store.

9. Using a round table discussion, you will find some of the "quiet ones" willing to participate with very helpful hints.

10. Another subject could be the use of lubricants, including oils and grease. Some areas to be covered could involve the how, when, where and why of lubrication.

11. What to use to keep body sweat out of watches could be presented.

12. Give a lecture on keeping up with the way to adjust new bands for length.

13. The best way to clean and polish jewelry makes an interesting program.

14. Another topic could be when to polish or replace crystals.

15. Everyone enjoys learning about the best way to sell repair.

The above should encourage members to attend more guild meetings. As Robert Phillip from the Ontario Watchmakers Association said in a recent letter to me, "Watchmakers are used to working alone and when not working at the bench they are off to other functions that have nothing at all to do with their trade or even the people they work with, even if they happen to work in a shop with other watchmakers." Maybe the way to keep them coming back is to have two programs containing different subject matter. One could be short and provided by members of the guild.

Let's all work together to replenish our trade! I am interested in your ideas for improving guild member attendance. Please write to me concerning this matter.

NEWS ...from all around the ASSOCIATION...

NORTH CAROLINA

The North Carolina Watchmakers Association will hold its 1988 Convention June 3, 4 and 5 at the Holiday Inn North in Charlotte, NC. The program will feature Jim Stewart of Florida on jewelry repair, Jim Harding of Virginia on the more difficult operations in clock repair, and Marvin Whitney, AWI Fellow, of Virginia who will speak on chronometers and telling time.

KENTUCKY

It was just a few months ago that we noted the illness of *Horological Times* writer R. Lloyd Mize; now we are saddened to report his death. Mr. Mize died March 11 after prolonged illness. The illness for many years required use of kidney dialysis procedures which taxed his efforts to work at the bench and continue his writing. It was only recently that other complications finally took his life.

We extend our condolences to his widow, Jean Mize, and to his sons. Mrs. Mize reports that Lloyd derived as much pride and satisfaction from his clock work as with anything else in his career. He was especially proud of his title "Certified Master Clockmaker". This was quite evident in his writings and his approach to the task of servicing clocks.

Lloyd Mize's articles were not "me too" articles. He frequently offered new and original ways to solve horological problems. Often the subtle humor he laced between the lines of his serious technical explanations gave evidence that he had truly mastered the skill to communicate difficult concepts in a pleasing and readable manner. Lloyd Mize's readers will miss his writing; however, the knowledge he contributed through his articles remains with us and future horologists.

NEW YORK

On Monday, March 2, 1988 at a meeting of the Horological Society of New York, in the Hotel New York Novotel, Peter Laetsch, President of the Watchmakers of Switzerland Information Center, disclosed that a new multi-organizational program to combat the distribution of "fake" watches had been completed. This was the first public announcement of the plan and was made during the course of Mr. Laetsch's talk on "Counterfeit Watches."

Before discussing the details of the plan, the speaker traced the history of counterfeit watches from the '50s to the present.

Although there are stiff penalties–both civil and criminal–for producing and selling counterfeit watches, new means are constantly being found to evade the law. For example, movements are being imported with blank dials so that customs is powerless to stop the shipments. The movements containing the blank dials go to basement operations where the dials are printed and cases and attachments are added to complete the watch. To combat these illegal operations, the Swiss Federation has an ongoing program of seminars for customs agents and FBI personnel.

But now, with a fund of 3-4 million dollars, the Watchmakers of Switzerland Information Center, the American Watch Association, and the Jewelers of America combined to create a new plan. It provides warning information and a toll-free 800 telephone number. Watch repairers, jewelers and consumers are urged to phone a central office to report counterfeit watches displayed or sold.

Near the close of his talk, Mr. Laetsch had a very important bit of advice to the watch repairer/jeweler. He said that when a prestige watch is accepted for repair, the ticket/receipt should read, for example, "one watch marked Rolex" so that, if the watch is a counterfeit, the customer cannot sue later claiming that his watch was switched.

This problem was pursued later in the question and answer period. George Gibson of Bulova warned that the switch claim can easily occur when the repairer becomes careless in the handling of small jobs, such as attachment replacement or repair.

PENNSYLVANIA

The Watchmakers Association of Pennsylvania will hold their ninth annual convention June 10-12, 1988 at the Holiday Inn East in Lancaster, PA. The programs include: James Broughton with a bench course on retrofitting; Bernard Stoeber giving a watch bench course; David Arnold conducting a course on the restoration of automated Swiss dial clocks; Marvin Whitney of AWI; and Bob Sener of Bowman Technical School on jewelry casting.

For more information contact Joyce Fenwick, 610 Bernhard Avenue, Mount Joy, PA 17552.

UPCOMING CONVENTIONS

Texas Watchmakers Association 41st Convention
May 20-22, 1988
Kahler Green Oaks Inn – Fort Worth, TX

Arizona Horological Association Convention
May 21-22, 1988
Embassy Suites Hotel – Scottsdale, AZ

North Carolina Watchmakers Annual Convention
June 3-5, 1988
Holiday Inn North–Charlotte, NC

Watchmakers Association of Pennsylvania Convention
June 10-12, 1988
Holiday Inn East – Lancaster, PA

Watchmakers Association of Ohio Convention
July 22-24, 1988
Parke University Motel – Columbus, OH

Nebraska & South Dakota Jewelers Association
83rd Annual Convention
August 26-28, 1988
Midtown Holiday Inn – Grand Island

Iowa Jewelers & Watchmakers Association
Convention & Trade Show
September 10-11, 1988
Airport Hilton Inn – Des Moines, IA

Classified Ads

Tradesman

ELECTRONIC EQUIPMENT SERVICE (tf)
WE ARE FACTORY AUTHORIZED SERVICE FOR:
* VIBROGRAF/PORTESCAP
* TICK-O-PRINT/L&R
WE SERVICE ALL MAKES OF ULTRASONICS AND OTHER WATCH RATE RECORDERS AND EQUIPMENT
JACK PHILLIPS
ELECTRONIC INSTRUMENT SERVICE
2 LOWER ALCATRAZ PLACE, MILL VALLEY, CA 94941
FOR INFORMATION CALL (415) 388-9289

WANTED: Quality watch repair, all types, CAT, for experienced watch repairmen looking for trade work. Experienced in quartz repair. Fast turn-around, quality trade work. Free telephone return estimates. Contact: Tim Ball, TRISTATE WATCH REPAIR, P.O. Box 786, Dyersburg, TN 38024; call collect (901) 285-5437 for further information.

CLOCKS: gearcutting, retoothing, repivoting, rebushing, jeweling. REPAIRING: Chronographs/timers, fusees, aircraft clocks, antique clocks/pocket watches. Send sample for estimate, SASE.–NIEGELS HOROLOGY, Roy Niegel, CMC, CMW, 101 E. St. Joe Drive, Spirit Lake, ID 83869. (208) 623-4330.

CUSTOM BALANCE STAFFS cut and fitted. Since 1922. James Bourne, CMW; P.O. Box 215, Ladysmith, WI 54848. Phone (715) 532-3166.

MECHANICAL & QUARTZ WATCH REPAIR: Ken Crawford, 2100 Crampton Road, Lynchburg, OH 45142; (513) 364-6198 evenings.

DIAL REFINISHING CO. FAST SERVICE, FINEST QUALITY, quantity works welcome. Specialize on changing dial feet positions to fit the quartz movement. Send your works to: **KIRK DIAL OF SEATTLE,** 4th & Pike Bldg., Suite 625, Seattle, WA 98101. (206) 623-2452

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

Cylinder escapements restaffed in platforms and watches. Write for shipping instructions. KEN LEESEBERG, RR 4, Box 286, P.O. Box 447, Montello, WI 53949.

CUTTERS cycloidal for clock wheels and pinions. Module 0.2 to 1.0. Constant profile producing traditional square bottomed teeth, 104 sizes. Escape cutters: recoil (set of seven sizes), dead beat (set of four sizes). Ratchets 60° and 70°. All cutters made in 8% cobalt M42 High Speed Steel, and heat treated under vacuum. Also cutter grinding wheels, Grit and CBN. Send for Information Sheet, prices and order forms to: P.P. Thornton (Successors), Ltd., Horological Cutter Makers, The Old Bakehouse, Upper Tysoe, Warwickshire, CV35 0TR, England.

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

Clock Wheels and Pinions made to your sample or my calculations. Pivots, teeth, missing wheel jobs. C. Lewis Pritchard, CMC, Cumberland Clock, RR 6, Box 497, Crossville, TN 38555.

CLOCK GEAR CUTTING OR REPAIR to your sample. Very reasonable rates, quality work with fast service. Kazen & Son, 215 N. Shia., Corunna, MI 48817. (517) 743-3431.

CLOCK WHEEL AND PINION CUTTING
Fast service – Write for free Brochure and price list. Fendleys, 2535 Himes St., Irving, TX 75060. (214) 986-7698

NEW SWISS QUARTZ MOVEMENTS CUSTOM FITTED to Diamond, Gold, Antique, Sentimental Watches and Pocket–all sizes. Rolex, Omega, Longines, LeCoultre, Girard Perregaux, Bulova, Elgin, Gruen, Accutron, Hamilton, Movado. Service and Quartz Conversion. **ALFONSO ZAMORA,** 280 Presidio Place, Buffalo, New York 14221; (716) 633-6138.

Watch wheel cutting, repivoting and staffing.
WE CAN MAKE ANY PART WE CAN RESTORE ANY WATCH
Free estimates, references on request, expedient services are provided. SASE for brochure.
WATCH & CASEMAKERS, LTD.
140 N. 7th Ave., P.O. Box 1314
Highland Park, N.J. 08904
Tel. (201) 937-5611

BALANCE STAFFS CUSTOM MADE AND FITTED. Call or write Lucian L. Lynch & Co., 1148 Brookside Dr., Hanahan, SC 29406; (803) 747-2586.

DIAL REFINISHING

BEFORE AFTER

Quartz Conversions
Diamond Dial Conversions
Emblem & Name Personalization

Write for Brochures

INTERNATIONAL DIAL CO. INC.
P.O. Box 236
Old Chelsea Station
New York, N.Y. 10011

Schools

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

For Sale

CLOCK TIMER. Regulate your clocks electronically with the new CTI Clock Timer. Can be used on almost any clock with mechanical escapement. Pendulum clocks large and small, lever or cylinder escapements, anniversary clocks, etc. For information write: Can Tho Instruments, P.O. Box 80113, San Diego, CA 92138.

CLOCK & WATCH SHOP–Sales & Service–Established Reputation 20 Years. Excellent Repairs & Sales. Good Location on Florida's Sun Coast. Sell Inventory Plus Business. Health Reasons. Please Reply to: Box FS4-50, c/o *Horological Times*, P.O. Box 11011, Cincinnati, OH 45211.

KUNDO AND SCHATZ PARTS mechanical, electronic, and quartz. Try us! Baltimore Clock Parts, 2004 Hillside Drive, Baltimore, MD 21207.

MINI QUARTZ MOVEMENTS. Guaranteed lowest prices–as low as $2.30. 2-yr. guarantee. Large selection of hands and numerals. Free delivery. SASE or call (704) 333-0221. Hall Clock Shop, 1512 Central Ave., Charlotte, NC 28205.

BU-700 Portescap for sale. Excellent timing machine for all your needs. $1900.00, or make offer. (608) 873-1933.

CUCKOO CLOCK AND BIRD CAGE BELLOWS MATERIAL
Save time, money, and work re-covering bellows. Easier than replacing. For information, send business-size S.A.S.E. to:
JANDI GOGGIN
Box 175H, Huntington, NY 11743-0175

GREENHILL CLOCK SERVICE
941-D Broadway, El Cajon, CA 92021
PARTS AND SERVICE HEADQUARTERS FOR SCHATZ, KUNDO, KOMA, KERN, HALLER, HERMLE, NISSHINDO. MECHANICAL-QUARTZ-ELECTRONIC-CIRCUIT BOARDS-MAINSPRINGS-SUSPENSION SPRINGS and MOVEMENTS, ETC.

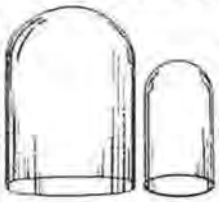
400 DAY DOMES: 5½" x 11" glass, $7.50 each, or 4 for $26, UPS included. For price list of 35 other glass and plastic domes, send SASE to: C.A. Zimmerman, P.O. Box 8973, Ft. Collins, CO 80525.

WATCHMAKING EQUIPMENT–Bestfit Material System 18 Cabinets stacking, all Swiss material assortments, stems, crowns, staffs, mainsprings, winding parts. Large quantity Swiss movements, large cabinet French glass crystals, 4 G-S filled crystal cabinets. Portescap VC-10, Microfiche Viewer, three L&R Watch Cleaning Machines, one Zenith. Electric Soldering Machine, Seitz Jewel Unit, various tools. LOVE'S JEWELERS, Rochester, N.Y. (716) 247-7660.

FOR SALE

LEATHER STRAPS . . . @$1.50 ea. up
RING GUARDS. . . . . @$3.95 dz. up
SP. BARS . . . . . @$1.60/100 pcs. up
ROUND CRYSTALS
Write To: FLORO DISTRIBUTOR
12-08 151 Place
Whitestone, NY 11357-1832

Glass Domes



Round, oval and rectangular in all sizes.
Also Watch-Stands.
Send for standard size list.
Reynolds Objekstander GmbH
P.B. 16 28
D-2110 Buchholz, W.Germany
Telephone: 011 49 4181 5582

BE ALL THE CLOCKMAKER YOU CAN BE! Thornton Cutters in stock. KEN LAW, CMC–H.C. 30, Box 825, Prescott, Arizona 86301.

JEWELRY STORE

Due to retirement and poor health an excellent opportunity to acquire a 40-year-old established business in Omaha's leading Suburban Southwest shopping center.

SACRIFICE

entire store, wall cases, showcases, large safe and all fixtures for less than the price of the inventory and parts. Watchmaker and employees will stay on if wanted. Montclair Jewelers, 2758 So. 129 Ave., Omaha, NE 68144.

CUSTOM-DESIGNED JEWELERS' NEWSLETTERS–We customize your four-page newsletter, write your articles, design, layout and typeset. From idea to 1000 printed: $289.00. 1-800-426-6018, (313) 542-4012.

Help Wanted

CLOCKMAKER WANTED–For one of Northern Virginia's foremost retail clock shops. Experience in antique and modern clock restoration a must. Salary commensurate with ability. Profit sharing, medical insurance, paid vacations. Send resume to: The Clock Shop of Vienna, 109 Church Street N.W., Vienna, Virginia 22180.

WATCHMAKER/CLOCKMAKER–Busy South Florida clock store. Send resume and address inquiries to: Carl Jackson, 1210 N.E. 163rd St., N. Miami Beach, FL 33162.

CLOCK REPAIRMAN. Excellent opportunity in expanding service department. Located in Midwest's most rapidly growing cities. Previous work experience helpful, particularly in watch repair, although not necessary. Health, Life, Profit Sharing, and Paid Vacations. Send resume to: Box HW-488, c/o *Horological Times*, P.O. Box 11011, Cincinnati, OH 45211.

WATCH REPAIR PERSON – Immediate position available. Experienced with mechanical watches, all calibres. Benefits. Salary negotiable. Call Mr. Leo, (215) 922-1495. Jules Jurgensen, 106 South 7th St., Philadelphia, PA 19106.

Books

WE BUY AND SELL

Books on Clocks, Watches, Barometers, Jewelry, Music Boxes, Repairs, Price Guides, and related subjects. In stock for immediately delivery. Send 3 stamps for free catalogue to:
ARLINGTON BOOK COMPANY
P.O. Box 327 - Arlington, VA. 22210
Telephone: (703) 280-2005

American Reprints Co.

BOOK IN REVIEW:
Eighth Edition
THE OFFICIAL PRICE GUIDE TO WATCHES
By Shugart & Engle. $12.95

1988 Vintage American & European Wrist Watch Price Guide
NEW AND LARGER
By Sherry Ehrhardt. $20.00

SCANLON AMERICAN REPRINTS CO.
P.O. Box 379 Modesto, CA 95353
(209) 667-2906

NOTICE

SOMETHING NEW!!!

In AUGUST be sure to look in our 1989 Clock & Watch Book Catalogue containing

NEW SOURCES

for your horological buying and selling needs.

You still have time to place an ad if you hurry and we receive it by June 1st, 1988.

For further information call Tran Duy Ly at (1-703) 280-2005 or write Arlington Book Co. P.O. Box 327, Arlington, VA. 22210-0327

Wanted To Buy

$$ WE WANT TO BUY YOUR WATCHES! $$

PATEK PHILIPPE, ROLEX, Cartier, Gubelin WANTED–Vintage Wristwatches & Better pocket Watches–Keywind, RR, Repeaters, Enamels, Gold or filled, watches need not be running. All types of watches purchased with payment made same day. When you're ready to sell–CALL TOLL FREE 1-800-235-2866. Maundy International Watches, P.O. Box 13028H, Overland Park, Kansas 66212.

We pay 97% of market for karat gold scrap (any amount)! Also, buy filings, gold fill, sweeps, silver, platinum! Immediate 24-hour payment return mail! Ship insured/registered mail to: AMERICAN METALS COMPANY, 253 King St., Dept. HT, Charleston, SC 29401. Established 1960. Phone: (803) 722-2073.

I need a New Haven movement, 30 day, 25" pend., for a calendar clock. I also need strike train, or movement for Ithaca calendar clock, cottage shelf #9, old model. Movement stamped "E.N. Welch. Pat'd Aug 30, 1870 Made for Ithaca Cal Clock Co." SLATON'S CLOCK SERVICE, 1025 George, Alton, IL 62002.

WANTED

Casting Equipment/Watchmaker's Tools–Equipment, material and crystal systems, benches, cabinets, old broken or unclaimed wrist and pocketwatches; watch factory pictures, displays or signs. Need G.F. 14K/18K Hamilton electric, Accutron, S.S. or Gold Moonphase Chronograph, LeCoultre Alarm/Futurematic, A. Lange watches, IRV BARD.

AVON METAL SERVICE, LTD.
P.O. Box 17484—(414) 351-0933
Milwaukee, WI 53217

WANTED–Resellable gold jewelry, surplus watches, gold filled and sterling jewelry. We will pay more than the melt-down price. Also buying all scrap including gold, gold filled, watchbands, batteries, filings, and bench waste. JEWELERS RECLAMATION SERVICES. 800 Lafayette, NE, Grand Rapids, MI 49503; (616) 235-1170 or (800) 342-9888.

WANTED

We Buy All Types Of
Jewelers Scrap–Any Condition.

Gold-filled Watchbands,
Plated Watchbands,
Silver Watch Batteries,
(Mixed acceptable–We sort free of charge & we pay for mercury)
G.F. Optical, Cases, etc.
GOLD–We pay up to 97% of the market price for 10K, 14K, etc. We buy filings, bench sweeps, filters, and buffing waste.

Please call or write for more information:

SPECIALTY METALS REFINING CO.
10 BAY STREET
WESTPORT, CT 06880

1-800-426-2344

In Connecticut call (203) 372-0481.

"We will match any legitimate offer and still give you our quick, dependable service."

Postage and UPS reimbursed.

OUR 46th CONSECUTIVE AD

Dates to Remember

MAY 1988

15—Horological Association of Indiana Spring Workshop; Jasper, IN. Information: P.O. Box 723; Shelbyville, IN 46176.

15—Retrofitting Bench Seminar (AWI); James Broughton, instructor; Jasper, IN.*

20-22—Texas Watchmakers Association 41st Convention; Kahler Green Oaks Inn; Fort Worth, TX.

21-22—Arizona Horological Association Convention; Embassy Suites Hotel; Scottsdale, AZ.

JUNE 1988

3-5—North Carolina Watchmakers Association Annual Convention; Holiday Inn North; Charlotte, NC.

3-5—Kansas Jewelers Association, Inc. Convention; Holidome; Hutchinson, KS. Information: Sharon Blair (913) 381-2033.

10—Retrofitting Bench Seminar (AWI); James Broughton, instructor; Lancaster, PA.*

10-12—Watchmakers Associaton of Pennsylvania Cenvention; Holiday Inn East; Lancaster, PA.

21-23—Research and Education Council Annual Meeting, Drawbridge Inn and Convention Center; Ft. Mitchell, KY. For more information contact AWI Central.

24—AWI Annual Affiliate Chapter Meeting; Drawbridge Inn and Convention Center; Ft. Mitchell, KY. For more information contact AWI Central.

25-26—American Watchmakers Institute (AWI) Annual Board of Directors Meeting; Drawbridge Inn and Convention Center; Ft. Mitchell, KY. For more information contact AWI Central.

JULY 1988

22-24—Watchmakers Association of Ohio Annual Convention; Parke University Motel; Olentangy River Road, Columbus, OH.

AUGUST 1988

6-8—1988 Heart of America MINK Jewelry Show; Doubletree Hotel; Overland Park, KS. Information: Sharon Blair (913) 381-2033.

7-8—Illinois Jewelers Association Chicago Show; Holiday Inn Mart Plaza/Expo Center; Chicago, IL. For more information: Jack Thompson, Convention Manager; 111 E. Wacker Dr., Suite 600; Chicago, IL 60601; (312) 644-6610.

26-28—Nebraska & South Dakota Jewelers Association 83rd Annual Convention; Midtown Holiday Inn; Grand Island.

SEPTEMBER 1988

8-11—Intermountain Jewelers Association's 27th Annual Convention; Jackson Hole Racket Club Resort; Jackson Hole, WY. For information: Ann Marie Molenaar-Schram, 1439 SW 4th Ave., Ontario, OR 97914. (503) 889-3213.

10-11—Iowa Jewelers & Watchmakers Association Convention and Trade Show; Airport Hilton Inn; Des Moines, IA.

18-19—Management Seminar (AWI); Fred Burckhardt, instructor; San Francisco, CA.*

30-Oct. 2—New York State Watchmakers' Association, Inc. 50th Annual Convention; The Hilton; Binghamton, NY.

OCTOBER 1988

8-9—Restoration of Fusee Watches Bench Seminar (AWI); Ralph Geiger, instructor; Chicago, IL.*

14-16—Antique Watch Restoration Bench Seminar (AWI); Archie B. Perkins, instructor; Boston, MA.*

* Contact AWI Central for more information.

Ad Index

EDUCATIONAL LIBRARY & MUSEUM CHARITABLE TRUST

AMERICAN WATCHMAKERS INSTITUTE, INC.

3700 Harrison Avenue, Cincinnati, Ohio 45211
Telephone: (513) 661-3838

Member
American Assn. of Museums

To the Members of the American Watchmakers Institute:

In your 1988 membership packet you received a brochure explaining the work done by the AWI Educational Library and Museum Charitable Trust. No part of Membership Dues is used for this work. The Trust must rely on donations and contributions for support.

The Trust is an excellent place to make contributions as memorials to departed members. Several State Associations have collected memorial gifts and forwarded them to the Trust. A letter of acknowledgement will always be sent to the donor and/or to the relatives of the deceased if requested by the donor.

Used batteries have been the main source of income for several years. Again this year State Chapters are requested to collect and bring batteries to the Annual Meeting. A contest will be held with prizes for the winning Chapter.

If you are not involved with a chapter, you may send the batteries directly to the AWI Central Office.

YOUR DONATIONS SUPPORT A WORTHY CAUSE AND ARE MUCH APPRECIATED. THANK YOU!

Trustees

THE RIGHT STUFF.

CAS-KER HAS IT.

- Watch Movements
- Watch Material
- Crystals & Fitting
- Watch Batteries
- Jewelers' Tools
- Supplies
- Casting Equipment
- Soldering Torches
- Findings
- Ring Mountings
- Clasps
- Solder

We have all the right stuff to make your job easier.

Quality, Service and Competitive Prices Guaranteed.

Call Toll Free: 1-800-543-0408.

Cas-Ker Co.

OHIO: 1-800-582-8027. $15 MINIMUM WATS ORDER.
FOR INFORMATION & INQUIRIES CALL 513-241-7073.
2121 SPRING GROVE AVENUE
P.O. BOX 14069 CINCINNATI, OH 45214