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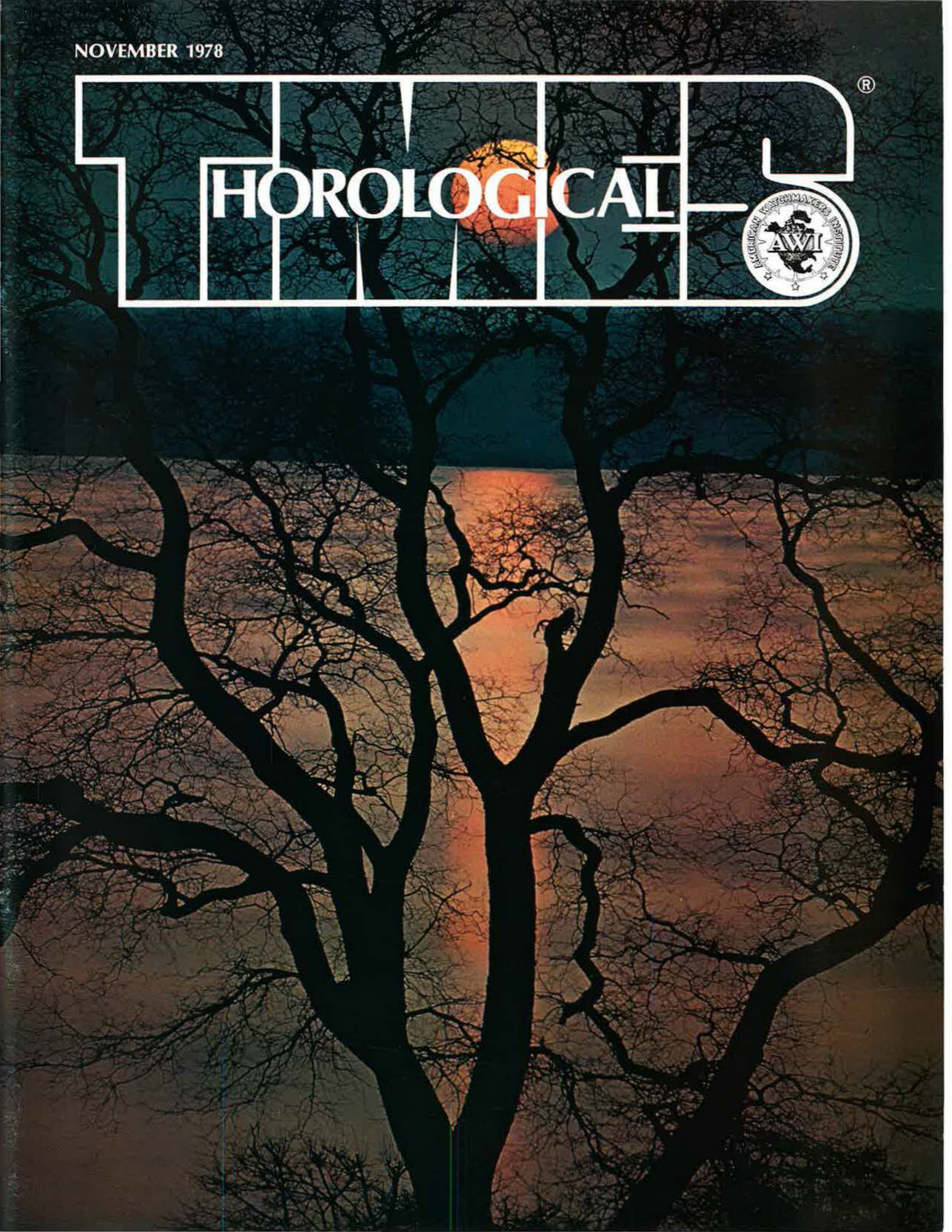
HOROLOGICAL TIMES®



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HOROLOGICAL TIMES

OFFICIAL PUBLICATION OF THE AMERICAN WATCHMAKERS INSTITUTE

Volume 2, Number 11 — November, 1978

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Editorial

When David did in Goliath, he knew better than to let the big fellow get a hold on him. A sit-down, hand-to-hand arm wrestling match would have flipped Dave through the nearest open window. So he used his head, kept his distance, and sailed a rock at the big boy's noggin. The meeting of the rock and Goliath's head spelled victory for little David.

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Our cover photo of a bare tree against a moonlit sky symbolizes the approaching dormancy of winter.

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STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION
(Required by 39 U.S.C. 3685)

1. TITLE OF PUBLICATION	A. PUBLICATION NO.	B. DATE OF FILING
Horological Times	3 8 7 0 6	9-26-78
2. FREQUENCY OF ISSUE	A. NO. OF ISSUES PUBLISHED ANNUALLY	B. ANNUAL SUBSCRIPTION PRICE
Monthly	12	$30.00

3. LOCATION OF KNOWN OFFICE OF PUBLICATION (Street, City, County, State and ZIP Code) (Not printers)
3700 Harrison Avenue, Cincinnati (Hamilton) Ohio 45211

4. LOCATION OF THE HEADQUARTERS OR GENERAL BUSINESS OFFICES OF THE PUBLISHERS (Not printers)
3700 Harrison Avenue, Cincinnati (Hamilton) Ohio 45211

5. NAMES AND COMPLETE ADDRESSES OF PUBLISHER, EDITOR, AND MANAGING EDITOR

PUBLISHER (Name and address)
American Watchmakers Institute, 3700 Harrison Avenue, Cincinnati, OH 45211

EDITOR (Name and address)
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MANAGING EDITOR (Name and address)
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B. PAID CIRCULATION 1. SALES THROUGH DEALERS AND CARRIERS, STREET VENDORS AND COUNTER SALES	None	None
2. MAIL SUBSCRIPTIONS	6990	7266
C. TOTAL PAID CIRCULATION (Sum of 10B1 and 10B2)	6990	7266
D. FREE DISTRIBUTION BY MAIL, CARRIER OR OTHER MEANS, SAMPLES, COMPLIMENTARY, AND OTHER FREE COPIES	380	420
E. TOTAL DISTRIBUTION (Sum of C and D)	7370	7386
F. COPIES NOT DISTRIBUTED 1. OFFICE USE, LEFT OVER, UNACCOUNTED, SPOILED AFTER PRINTING	380	424
2. RETURNS FROM NEWS AGENTS	None	None
G. TOTAL (Sum of E, F1 and 2—should equal net press run shown in A)	7730	7810

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PS Form 3526, Mar. 1977 (Page 1) (See instructions on reverse)

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The President's Message

BY ORVILLE R. HAGANS, CMW, CMC

There is a period in the life of every successful businessman after he has passed through that thrilling race for mastery in his youth, when he enters the middle years of sensible thought and steady, progressive planning, and when he comes to the realization that he has accomplished but little. This is the age of reason, judgment, common sense, and is usually the threshold of success, for "success is not in the wealth of the things one possesses," but in the "service rendered to our fellow man."

Where the desire for learning or the yearning for advanced education in any calling is absent, then the possibilities of advancement or progress are limited, and in many instances entirely circumscribed. Where hope does not exist, and is not supported by a motivated desire, then stagnation sets in and the opposite of progress, which is retrogression, controls. There can be no middle ground, for if we fail to advance through either lack of desire or absence of opportunity, we recede both mentally and physically.

We find prevalent today, as we discovered early in our own training and experience, that almost inevitable egotism which proves an invariable and insurmountable obstacle in the progress of most young men. There is a station in the experience of every man who reaches the point of reasonable proficiency in craftsmanship, when he assumes an attitude of self-esteem and unctuous personal pride. When he feels that he has reached the highest point of efficiency in his profession that is possible to reach, he assumes that he has attained the zenith of his calling, and often looks with scorn on his fellow craftsmen, whom his own egotism has placed in a lower stratum of usefulness. But let me say, beware, "pride goeth before a fall, and a haughty spirit before destruction."

In all the chronicles of eminent achievements of men whom we are prone to give honor because their names have been preserved to us through the years, whether in history, religion, or science, we find that spirit of humility and contrite service predominating. All such have lived primarily to serve. Their lives and energies were spent in rendering a duty, the reward of which was the joy of giving.

When we contemplate the opportunities offered by the scores of watchmakers' organizations throughout the country and being conscious of the attainments possessed by the many leaders unquestionably qualified to guide, we can envision only success for this splendid movement.

That inevitable result which has followed in the wake of all such slow-moving transitions in the past, where the smothered hopes of stalwart pioneers have arisen to become the guides in such movements, will repeat itself when the history of AWI is written.

Those dormant powers, reverberating down through the ears from the voices of our predecessors, who strove so earnestly to arouse the slumbering thoughts of the men who had espoused the profession and science of horology, have proven as seeds sown in fertile soil, and they have at last burst forth into a growth which has unlimited possibilities.

This eruption of ideas has been slow-moving in its beginning, but its present status indicates that it shall, regardless of mounting obstacles which are ever appearing, go forward with uninterrupted strides to that goal of inevitable success to which it seems destined. This result is not a mirage, but is a vision of the near future, and to those of us who have been in the battle for so long there comes a joy and satisfaction unspeakably reassuring, that, since the goal of our years of labor is in sight, we shall "pass the torch" to our younger successors whom we must believe will "bear it aloft" and "will not fail us."

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Questions and Answers

by Henry B. Fried

CMW CMC FBHI

400-DAY CLOCK SAGA

(Editor's note: the original of this question and answer was printed in a recent issue of Horological Times. *Since that time, additional developments have taken place in the story. We are reprinting the original here, along with additional recent correspondence between Robert Miller and Henry B. Fried.)*

Q. I have in for repair a Kieninger & Obergfell 400-day clock (see *The Horolovar 400-Day Clock Repair Guide* plate 1367). The clock needed cleaning so I cleaned and lubricated it (and the mainspring) and replaced the badly bent suspension spring. The original spring was 0.0032 in. and I installed a new 0.0032 in. spring. The clock then gained 4 hours a day. I raised the suspension fork to where it was just below the hanger so that it would not hit the hanger. I also closed the fork tines to where they had just minimal clearance as instructed in the book. The anchor makes a slight jerk as the escape wheel makes the move from dropping off the entrance pallet to pick up the exit pallet which it also does in the opposite direction. I have watched closely and cannot see the anchor fluttering over several teeth. After these adjustments the clock still gains 4 hours per day at the mid setting of the pendulum adjustment. I have changed to a 0.003 in. spring and the clock still gains 2 hours per day at the slowest setting of the pendulum. The U-shaped area around the anchor pivot hole does not appear to have been bent and the pallets do not show signs of having been tampered with.

This is starting to drive me batty and I would like to know what I need to do to reduce this time gain.

Robert A. Miller
Billings, Montana

A. I have read your letter carefully and I have come to the conclusion that although you state that you have not observed an escapement flutter, one does in reality exist.

These clocks may not show a flutter as you observe them but at times when they are not observed and during some minor disturbance, for example when a heavy truck passes outside, there is enough of a tremor to cause this fluttering. It may sound a bit illogical to you but bear with me and do as I suggest.

Advance one of the adjustable pallets just a little bit; don't overdo it. That will prevent the fluttering and your original replacement spring will be within regulating limits.

I saw Charles Terwilliger very recently and he said the same thing. He knows the clock most intimately, much better than I do, and knows its idiosyncrasies. He suggested the advancing of the pallet (one only).

Try this and if you have any further trouble, let me know and I can try further. In fact I'd like to know just how you make out in any case.

Q (continued). In accordance with your instructions I advanced the entrance pallet 0.010 in. with no improvement and an advancement over this amount caused even more problems. I then returned the entrance pallet to its original position (I had miked the original position), and started advancing the exit pallet with better results. I was able to advance the exit pallet 0.020 in. which brought the clock to only 1.5 hours fast per day, instead of 2 hours per day. Anything over 0.020 in. advance on the exit pallet caused the pallets to dig into the escape wheel and stop the clock.

When I cleaned the clock the grease on the mainspring was very sticky and I have used OL207 to grease the spring as I feel that it is a more slippery grease.

With the grease pallet so well advanced I feel that there is no more danger of flutter but the clock still gains 1.5 hours per day. My only choice left seems to be a change in the mainspring or suspension spring or both. Which way?

A (continued). I must admire your patience and resolution in sticking with that 400-day clock problem. Once in a while these clocks can become very mysterious in hiding their faults. However, since you do seem to have that admirable persistence, why not extend it to a few experiments?

First, when time permits, place the minute hand exactly at the 12 position and stopwatch time it for 10 or 15 minutes at a time of day when things are quiet, both business and traffic-wise. If the clock does keep time then it will tell you that (1) the suspension spring is correct; (2) the clock does keep time; (3) your clock most likely does chatter, skipping escapement teeth when not observed due to some unobserved phenomena.

A clock that gains 90 minutes a day varies 225 seconds an hour. In the observable time of 15 minutes, it then should gain 56 seconds. Your clock should beat 8 times a minute; each oscillation therefore amounts to—or should—7½ seconds each way. The reason I suggest the 15 minute interval is that this length of time is more discernible than the shorter periods.

Again, I've spoken to Mr. Terwilliger who sees more of these clocks than anyone else I know. He maintains that

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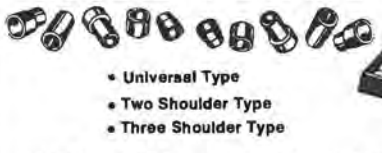

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despite your observations, the clock undergoes a period when fluttering of the escapement occurs. He also says that these clocks can keep time for a period during a day, then some agitation from an outside disturbance (or inner disturbance, for example suddenly two mainspring coils rubbing against one another) causes the fluttering.

When making your escapement adjustment, make certain that both inside and outside escapement drops are equal and at least, sufficient. If after your timing tests indicate close observation and the clock keeps uniformly fast time intervals under these observation periods, then you may try other suspension springs. Again, I'm curious as to how you made out–hopefully well.

Q (continued). Thanks to the encouragement given to me by yourself and Mr. Terwilliger (plus my mulish stubbornness) I have finally brought the operation of the 400-day clock under control.

Following your initial suggestion, I tried advancing the pallets to insure that the escapement was not fluttering. In order to keep control of the adjustments I measured the extension of the pallets from a given point on each side of the anchor. My starting measurement on the entrance pallet was 0.245 in. and that for the exit pallet was 0.245 in. Over a period of time and much testing, I ended up advancing the entrance pallet 0.007 in. and the exit pallet 0.009 in. Any more (even as little as 0.001 in.) advance of either or both pallets caused the escapement to lock up.

I then proceeded to the suggestion in your second letter and ran a 15 minute test with the 0.0032 in. suspension spring. With the pendulum set in the lowest speed (to slow the speed as much as possible) the duration of the oscillation was 6½ seconds and the clock gained 2 minutes in the 15 minute period (2 hours per day!). Then with a 0.0030 in. suspension spring the oscillations were 7 seconds each (at the slowest setting) and the clock gained about 1 hour per day. Then with a 0.0028 in. suspension spring (and the clock set as fast as possible), the oscillations took 9 seconds each way.

I returned to the 0.0030 in. suspension spring and started to reduce the thickness a bit at a time until I could have oscillations of 7½ seconds at the mid setting point. The 15 minute test produced an error of less than ¼ second which will allow me to put the clock in time finally. I now have the clock down to less than 3 minute error per day, so it shouldn't take too much longer to get it back where it belongs.

A measurement of the final thickness of the modified suspension spring shows just a smidgen over 0.0028 in. for most of the length.

A (continued). Thank you for the results of your tries with the torsion pendulum clock.

Honing the suspension spring, of course, will slow it down, but that is to be avoided if possible, as the honing seldom is equal along its full length and for really accurate isochronal timing a good new spring is best.

I remember that during World War II when springs could not be had, I used an alloy hairspring from a Westclox alarm clock and it worked well enough. The clock was one of my own and with a platform disc pendulum rather than the four balls. I experimented with it to bring it to time without honing. I used various tiny trinkets such as a college lapel pin on one side and my old high school Arista pin on the other, moving these diametrically in or out from the center. It worked out well and was a rather pleasant dynamic display of these ornaments.

I hope that your story with this clock will help others–or bring in other's experiences with recalcitrant anniversary clocks.

Howard

Q. Enclosed is a photo of a watch we have in our possession. It is marked: E. Howard & Co., Boston, Serial No. 12060. It is in a coin silver case. Reed's patent is marked on the

ratchet wheel. There is an "N" stamped on the plate just to the left of the regulator scale. The regulator pivots directly off of the balance cock.

Can you tell me:

1. Is this a watch that would interest collectors?
2. Is the Serial No. 12060 considered low? What is its approximate age?
3. What was originally at the top of the pendant? What presently projects looks like either wood or bone. Was there originally a metal cap of some kind?

I thank you for any information you may be able to forward to me.

Robert B. Wack
Newburgh, New York

A. Your Howard watch was made in 1861, about three years after they started to produce watches. It should be considered a collector's item. Howard seldom made more than 20,000 movements a year at best. During the early years, 5,000 was more the figure after the 1860 period.

The top of the pendant was a narrow, silver crown, slightly knurled. This was used as a button upon which to press to open the cover of the case. The letter "N" only noted the size of the movement, which in your case was 1 13/16 in. Reed's patent was to cover the arrangement of the barrel.

Examine the escapement; some had "resilient escapements." If you will send me an accurate *sketch of the escape wheel teeth and the pallets I can tell you whether it is that type which would make the escapement and movement even more desirable. I have a few such in my own collection.*

Jewel

Q. At present I am trying to locate–so far without success–some place where I could purchase a jewel to fit into an escapement platform of a French carriage clock. I bought the platform ($25), but when I drilled holes to fit it into the works, the jewel dropped out and was lost.

I hesitate to buy another platform because the same thing might happen again.

If anyone at the Institute can answer my question, and help me in my dilemma, I will be very glad to mail my check to join the AWI.

David Yurow
Washington, D.C.

A. There should be no problem at all in obtaining the jewel to fit the platform escapement, especially if it is a new replacement.

There are at least two places to obtain this. One, write to Sam Greenglass, c/o John A. Poltock Co., Inc., 87 Nassau Street, New York, NewYork 10038. Describe to him exactly the type of jewel you want and the type of platform and the make. Later, if he can't understand you or give you the exact jewel, you may be able to send him the entire platform and he'll fit it.

The other party is Marvin Whitney, the treasurer of the AWI; he is the country's leading authority on the marine chronometer and does fine work. He lives in the Washington vicinity. You may call him for over-the-phone advice, and I am enclosing his number for your use.

Joining AWI will be one of the happiest moves you will make. It would take a long time to describe the benefits.

Watch Dating and Companies

Q. I would like a copy of a bulletin by Mr. Fried which explains how to "date" watch cases by the marking stamped in the case. If available, send COD or at your convenience.

Also, is there a book or brochure listing watch companies of the world?

I have a 19 jewel open faced pocket watch, size 19 lignes, by Borel and Courvoisier of Neuchatel, case and movement No. 62684, coin silver, hinged double backed, back bezel, hinged front bezel. Can you date and identify?

Johnny R. Seat, Jr.
Huntsville, Alabama

A. The article on dating by the hallmarks in the watch cases (for all English silver and gold cases and most Swiss and French semi-precious and gold cases) appeared in the Jewelers Circular-Keystone, *for whom I write serially. A book that lists watch and clockmakers of the world by Baille is available from the library of the AWI on free loan to paid-up members. Also, books on hallmarks are available from our library as well.*

In my own notes, I have also noted that I have examined watches by Borel and Courvoisier of Neuchatel with the same hallmark and trademark, with the notation that they were Swiss watches of the 1880 period with a B+ grade quality movement. The lever set also was used in larger Swiss watches of that period and into this century.

As to the hallmark article, I would suggest that you write to the Jewelers Circular-Keystone *and ask for copies of that article on hallmarks, which appeared in July 1976. Their address is Chilton Way, Radnor, Pennsylvania 19089.*

Dudley

Q. Can you give me any information on the Dudley Watch Company? I would like to know the approximate age of their emblem watch movement #619 in a 14kt gold case #959292.

Also, would you recommend a book on the history of American watches and possible dates of manufacture?

Thank you.

Stuart E. Pirie
Las Vegas, Nevada

A. The Dudley Watch Company of Lancaster was in business from the early 1920s to the 1928 period. During that time they made about 6,000 or a few more watches, most with the skeletonized plates forming the various Masonic emblems. Today, these are collectors' items.

Dudley was a superintendent at the Hamilton Watch Company when he conceived the idea of making such a watch and opened a plant in the same city to do so. He used many Hamilton parts and escapements. The watch never was a financial success and eventually he went broke. The rest of the parts, machinery and tools were bought out by the X-L Watch Company of Maiden Lane in New York City who from time to time assembled these. As a young man I used to help Mr. Menche and Mr. Kolton after my work hours, assembling these, fitting each part by hand and watchmaker's lathe. Mr. Menche continued to assemble these form parts and had others made for him in Switzerland. Yours was one made completely in Lancaster.

As for a book on the history of American watches, obtain either Crossman's or Abbott's History of American Watches. *This can be had either from the library of the American Watchmakers Institute or by purchase from them. As for dates, obtain the book,* All You Wanted to Know About American Watches . . . *by Townsend, also available from AWI.*

When submitting a question to Henry Fried, please enclose a self-addressed stamped envelope. Thank you.

□

In the Spotlight

by Orville R. Hagans

CMW CMC FBHI

NUMERATION OF CLOCKS AND WATCHES

From the Manuscript and Photo Library of Orville R. Hagans

The story of horary (hourly) horology had its beginning in the remote scratch dial of antiquity when the hour lines all radiated from the style-hole and according to the particular subdivisions of the day were simply counted, not marked by figures at all.

Thus, the early civilizations counted their solar hour lines in telling the time. The early numerals of ancient Egypt and the Mesopotamian countries were simply groups of straight marks used as small numbers with symbols to indicate the larger ones. The ancient Romans began to numerate their sundials about 290 BC, using their numerations, but it was in their hydraulic device, the clepsydra, that hourly numerations for the dials of these instruments equaled 24 hours, being numerated from I to XII from the top to the bottom of the dial and the same again from bottom to top.

We glean by research that the Egyptians and other peoples of the Near East adopted the Roman numeration to replace their counted radial marks.

The Chinese had their horary systems, the principal being the division of the full day from midnight to midnight into 12 double hours. The names of the hours in Chinese characters denoted them.

Figure 1.

Arabic numeration, so common to the dials of clocks and watches today (1 to 9 and 0) was devolved by Hindu mathematicians about 300 BC and came to the Arabs in the ninth century AD.

Our really first static horological numeration was therefore Roman, the dials being marked by Roman numerals placed radially, the bottom of each figure towards the center of the dial. They were in some instances staggered on the dial face as indicated in Figure 1.

In Europe the thirteenth century writings began to show the arabic numerals and in the fourteenth century they had almost reached their present shape and figure formation.

They came into use in our mechanical horology in one instance in the fifteenth century and were later commonly used to figure duplicate, the Roman numerals being used in an outer figure ring on the dial as in the watch of 1660 shown in Figure 2.

Figure 2.

Numerals on clock and watch dials were engraved or incised and usually filled with black wax, but in some instances gold fillings have been used on the dials of watches.

Lord Grimthorpe, the celebrated horologist, designer of "Big Ben," London's clock, introduced the short thick

radial stroke to indicate the hour by the position of the hands only, instead of Roman or Arabic numerals. He tried this out on the turret clock at the dining hall of Lincoln's Inn, with marked success, though there were many conventional objectors at the time.

This radial mark has much to recommend it generally. It does not clutter up the dial with figures and gives a more distinct reading of the time, especially at a distance.

Today this has become the common dial notation. In our research, however, we have gleaned that Grimthorpe was not the actual originator of replacing the numeral with another sign. One Pierre Frederick Ingold, a Swisss citizen 1787-1878, in 1832 in Paris made a watch which had a crowing rooster engraved as numerals on the enamel instead of common numerals, the crowing cock being the herald of the hour of old. This was made for Madame Knox and was called the "cock-crow watch."

The story of horological numeration is interesting and dates from the early mists of antiquity.

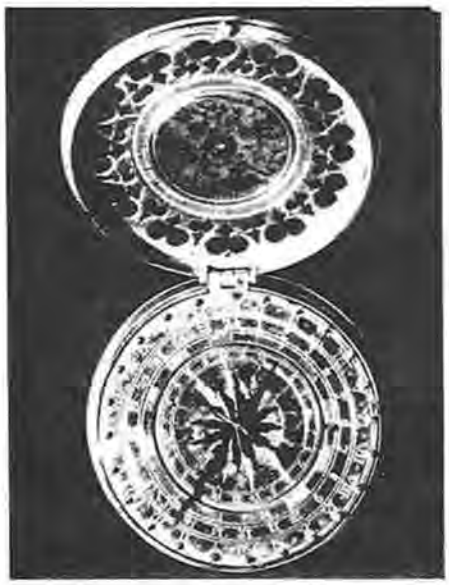
BEAUTY AND ART FROM THE PAST

from the Manuscript and Photo Library of Orville R. Hagans

One of the finest collections of watches can be seen at the Edison Institute, Dearborn, Michigan.

Mr. Ford's love for watches and clocks preceded his automotive interest as known today. His first work was that of a watchmaker, and naturally as time progressed he amassed a wealth of historical pieces.

We herewith present a few of the watches in the Ford Collection for your pleasure and knowledge.



S-100—One of the earliest timepieces in the Ford collection, made in Germany about 1550. It is drum shaped, made of bronze and gilt.

S-101.

S-102.

S-101—The movement shown is of steel and has an alarm. This also shows the foliot or dumbbell balance and the stackfreed, which is to equalize the power of the spring.

S-102—Bronze-gilt case; also dial, except the numeral ring, which is of silver, single steel hand.

S-103—Shows the movement, with wheel balance and stackfreed. Also has sun dial on inside of back cover.

S-104—Circular alarm watch, bronze-gilt case, silver numeral ring.

S-105—Shows the movements, of brass, with steel balance wheel, geared stopwork for alarm, fusee with catgut.

S-106—Bronze-gilt case, pierced and engraved, showing the crucifixion and other religious symbols.

S-107—Shows the dial with lid open. Lid is pierced to show the time on dial when closed. Dumbbell foliot with pig bristle for balance spring.

S-103.

S-104.

S-105.

S-106.

S-107.

S-108—Silver case with gilt metal band.

S-109—Shows dial of gilt metal with silver numeral ring. The case and dial are engraved with symbolic figures. Made by Jolly, Paris, 16th century.

S-110—Cruciform bronze-gilt watch with rock crystal front, back and sides. Balance wheel. No hair spring. Fusee, with catgut. Made by Serman, Paris, first half of 17th century.

S-111—Same watch, rear view.

S-112—Four-lobed, crystal cased watch with bronze-gilt frame; dial also of bronze-gilt. Single steel hand.

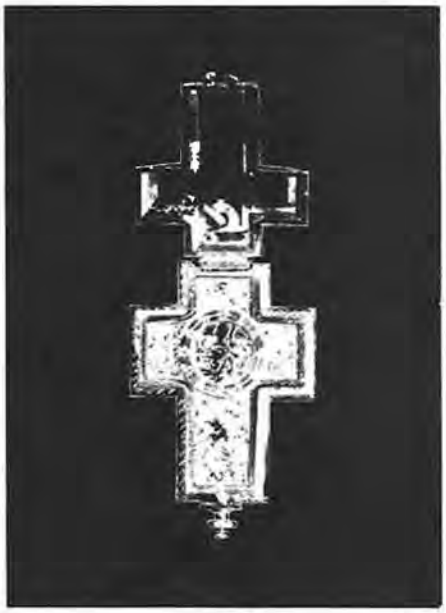
S-113—Faintly shows movement through crystal. Steel balance wheel. Fusee with catgut. Made by P. Chope, 17th century.

S-114—Cross-shaped watch with dials, showing (center) time, (bottom) month, (top) day of month, and left to right, respectively, phases of moon and sun. Gold case with flares studded with diamonds.

(Continued on page 36)

S-108.

S-109.

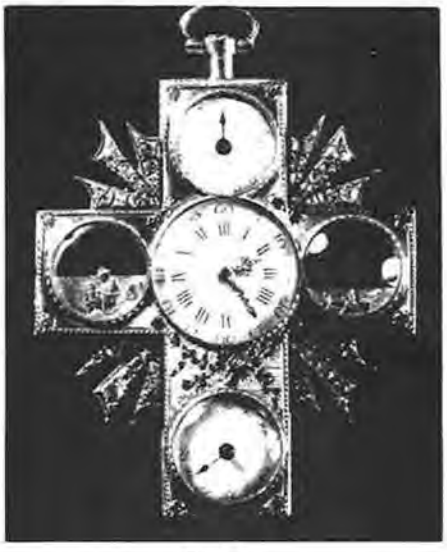


S-110.

S-111.

S-112.

S-113.



S-114.

THE SHIP'S CHRONOMETER © 1978

by Marvin E. Whitney
CMC CMW

REASSEMBLING AND OILING A CHRONOMETER

Generally, chronometer assembly, with a few exceptions, is accomplished in the reverse order of disassembly. We will assume that all repairs have been completed and the movement cleaned. Although some mention will be made at times during reassembling regarding inspection and repairs, the primary areas of repairs will be covered in separate installments.

The following assembly precautions are no different from those followed when assembling a watch or clock.

1. Do not force parts on each other. If parts do not fit together easily, it indicates that the part is either being assembled improperly or is burred and should be disassembled and checked.

2. Before tightening any of the bridges, be sure that pivots are in their respective pivot or jewel holes and that the wheels and pinions are in correct mesh. After the bridges have been properly positioned, check all parts for freeness.

3. Even though all parts have been checked and/or repaired before assembling, to insure that nothing has been overlooked, continued inspection is carried out during the various stages of assembly. Check the pivots, particularly for polish, straightness, and cleanliness and see that the teeth, pinions and wheels are clean and not damaged. Check all jewels for tightness, cracked, pitted, or chipped holes and cleanliness.

The type of lubricant and methods used vary little from what today's watch/clockmakers employ. Great care must be taken in lubricating watches and clocks and this same care applies to chronometers. A movement whose parts have been perfectly cleaned and skillfully repaired must be oiled properly to insure that it performs perfectly and trouble free. The old adage of "using the proper tool to perform a specific operation" is also true for oiling. Always use the proper type of oiler, the correct type of oil and make certain it has not lost any of its lubricating qualities because of age or the presence of foreign matter.

All too often the watch/clockmaker has a tendency to look upon the oiling operation as a simple matter. However, it is one of the most important and delicate operations performed. How often have we all seen where a very good overhaul job has been negated through careless oiling.

As with a watch or clock, the movement is oiled at various stages of assembly and will be noted during the reassembling operation. Also, the same general precautions that pertain to applying oil to a watch or clock also apply when one is oiling a chronometer.

The types of lubricants used for chronometers are in most instances the same used for watches and clocks. Some oil manufacturers have a special type of oil for chronometers but one can do just as well with any good grade of watch and clock oil. For years at the Naval Observatory a Nye's chronometer oil made from porpoise jaw oil was used with very good results. When the Hamilton was produced, Hamilton recommended the use of its Red Oil #47, Argon Oil ("R" mineral oil) and Hamilton T-324 grease. These lubricants were not only used on Hamiltons but on other instruments being repaired, with very excellent results. On chronometers being assigned for use in the Arctic region, Elgin 56b oil was used. The Elgin oil was used on the mainspring, all pivots and on those points that were normally greased. The only other change that had to be made when preparing chronometers for Arctic use was that all end and side shakes had to be increased. By increasing the shakes and using Elgin 56b oil, the instruments performed rate-wise just as well as they did in more temperate climates and with practically no mechanical failures.

Thus, as long as the repairman uses a lubricant that has all of the essential qualities of a good lubricant, it becomes a matter of personal preference. Through research and experimentation, today's lubricants are so superior to what was available years ago, that it becomes a matter of choice as to what brand gives the repairer the best results.

In assembling, there are two trains of thought as to how the repairman should go about reassembling the movement. Some repairmen like first to assemble all of the subassemblies, e.g., cap jewels, mainspring, fusee, etc., so everything is ready to be installed when they come to that phase

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SEIKO

of assembling. Others prefer to assemble the subassemblies as they are needed. No matter what system is used, the end results are the same. However, I have always been time and motion conscious and felt that by having all subassemblies ready for installation, it saved time. So in this treatise, I have described the assembling of the various subassemblies first.

Begin assembling the movement by replacing all the cap jewels. Make certain the marked cap jewel settings are replaced in their respective seats and that the cap jewel screws are tight. Oil all cap jewels with a good grade of watch oil. After all caps are oiled, inspect each one to make certain it has the proper amount of oil and that the oil ring is centered. The oil ring should be about two-thirds the diameter of the cap jewel. If the oil ring is not centered, either one of the jewels is not perfectly flat or the setting is not properly seated.

In most foreign and continental instruments the upper balance cap jewel is a rose cut diamond fitted in a beautiful blued steel bushing and thus, easily distinguished from the others, while the other caps are burnished in brass bushing, and if properly marked during the disassembling, are easily and correctly positioned. However, in the Hamilton, all of the caps jewels are fitted in elongated setting and since the upper balance cap jewel (diamond) is polished flat on both sides, it is not as discernible as the foreign or continental style. To determine which is which with the Hamilton, the upper balance cap jewel is clearly identified by having both sides flat while all other caps are red (rubies) and flat on only one side. All of the Hamilton cap jewels are interchangeable but because the under surface of the setting may have been milled off in adjusting end shake, it saves time and is less confusing to mark the setting during the disassembling so it can be replaced correctly after cleaning.

Next we place the barrel cap on the barrel and test whether it is true and free. If the barrel is fitted with a brace, grease or oil and install the mainspring brace in the barrel, making certain the angle of the ends is positioned correctly to prevent slipping. Then oil the mainspring with a heavier oil before it is wound into the barrel. A simple method of oiling the spring is to soak a folded piece of watch tissue or lint-free cloth in a good grade of clock or mainspring oil and move it from the outer terminal of the spring until the end of the inside coil is reached, using care not to distort the spring. Hamilton recommended applying a thin layer of grease along the length of the spring with a syringe, making sure the grease covers the entire flat surface of the spring. Some of the Observatory's chronometer makers used grease while others preferred a heavier type of oil. Although a number of tests was conducted to determine the merits of each, nothing conclusively was obtainable. The main thing is that if it is properly done, it did not matter what—oil or grease—was used.

Install the mainspring in the barrel with a mainspring winder, making certain that it is hooked to the mainspring brace or to the barrel. Before replacing the barrel arbor, the bearings should be lubricated with grease or a heavy oil. After making certain that the mainspring is hooked on the arbor, align the barrel cap slot with the mark on the barrel and snap the cap into position or, in the case of Hamilton, secure the cap in place by the five barrel cap screws. Check the end shake and if it is too tight, place the barrel cap down, on a piece of brass tube, or an old and smaller clock barrel or on the open jaws of your bench vise, and strike the end of the arbor with a brass or plastic hammer. Check the cap to see if it remains flush with the top edge of the barrel.

Next, place the fusee, square end down, on two pieces of button pithwood which have been pinned or glued together with a center hole extending down through both pieces. Or if you care to make a more sophisticated assembly block, take a piece of 1½ to 1¾ in. diameter plastic stock, cut it off so it measures approximately 1¼ in. in height, drill a 3/8 center hole, and then polish the top. See Figure 1.

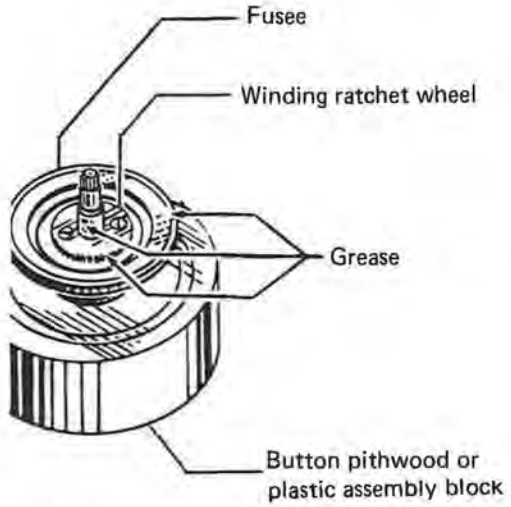

Figure 1. Fusee and ratchet wheel.

Now attach the fusee winding ratchet wheel to the fusee with two screws. Sometimes the repairman may choose to leave this intact and not remove it during the disassembly operation. Lightly grease the winding ratchet wheel teeth, as shown in Figure 1.

If the winding pawl spring has been removed during the disassembling, assemble the springs and apply a drop of oil to each post and grease the pawl springs where they contact the pawls. See Figure 2. Many instruments have only one pawl and spring.

Place a small dab of grease on the bottom of the flex end of the maintaining spring. See Figure 3. Then place four or five drops of grease on the inside lip of the fusee wheel and a small amount of grease on the outside of the center hub. Then position the maintaining spring in the recessed area of the fusee wheel. Grease the fusee arbor above the winding ratchet wheel. Then apply several small dabs of grease on the elevated outer rim, on top of the fusee.

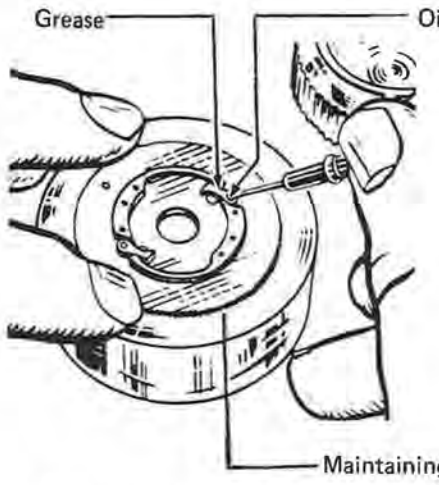

Figure 2. Lubricating the winding pawl, spring and pawl.

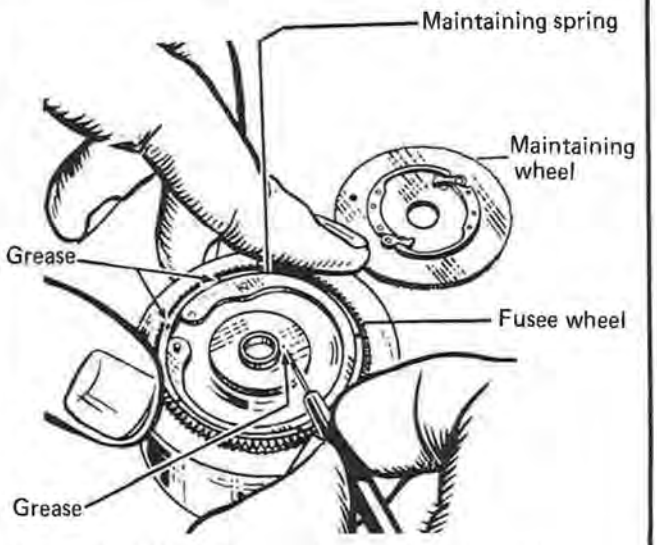

Figure 3. Maintaining spring positioned and lubricated.

Next place the maintaining ratchet wheel on the fusee, using care to see that the pawl or pawls are properly positioned into the teeth of the winding ratchet wheel. To check, turn the wheel and you should hear or feel it ratcheting.

Put the fusee wheel in place on the fusee, aligning the pin on the maintaining spring up with the hole or slot in the maintaining ratchet wheel. Check for freeness by flexing the wheel slightly. It should flex four or five degrees.

After placing three or four small dabs of grease in the recess of the fusee wheel (Figure 4), position the fusee end piece and insert the tapered pin into the arbor hole and force it home. The pin should be inserted on the side from which the end piece was marked.

Then test the freedom of the assembled fusee by turning the fusee wheel in a counterclockwise direction. If it appears to be too tight (very little or no end shake), check first to see if the tapered pin was inserted in the proper direction. Sometimes just reversing the pin will give you the proper amount of end shake. If this does not improve the shake, you can either file a very small slot in the end piece or grasp the fusee wheel between your left thumb and forefingers with the

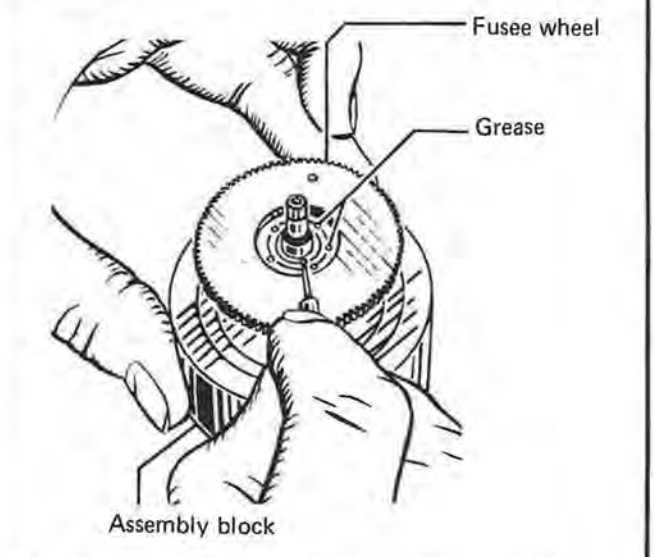

Figure 4. Lubricating before installing end piece.

square extending downward and strike the lower fusee pivot a sharp blow with a brass or plastic hammer. This will spring the tapered pin slightly giving the desired shake. A word of caution, though: do not strike it too hard as it is easily overdone.

If the end shake is found to be excessive, which very seldom occurs, fit a very thin brass washer made out of shim brass under the end piece or make a new end piece.

Should the fusee be fitted with the English key type of end piece (slotted), to increase or decrease the shake, you either dome or flatten the key, as required. The force fit of the key gives to the fusee the necessary tightness to ensure that the parts are held closely together, yet they will function freely and properly.

In those instruments fitted with a winding stop bar, turn the fusee over and place a dab of grease on the top and bottom of the bar. See Figure 5. Before positioning the spring

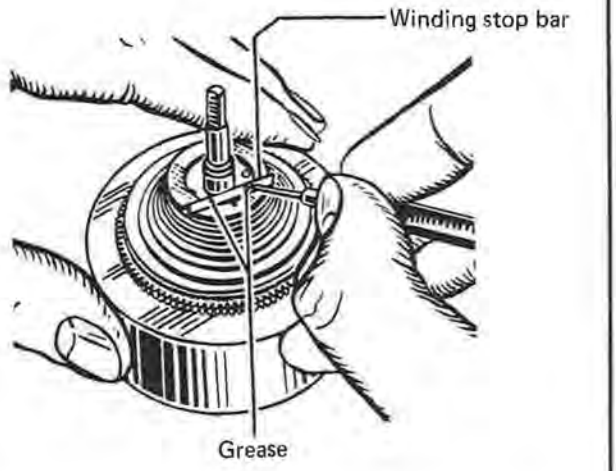

Figure 5. Assembling a lubricating winding stop bar.

and securing the top plate, check the freedom and action of the bar and also its position, for one end is curved slightly to conform to the arc of the fusee groove when the chain comes in contact with it.

On instruments fitted with a fusee stop iron, screw the stop work with spring into position on the underside of the barrel bridge. Apply a little oil to the slot where the stop piece operates and also to the spring where it contacts the stop iron. Check the stop iron to ensure that it works freely up and down.

Now with all of the subassemblies assembled we are ready to put the movement together. If your movement is fitted with a mounting ring, place the pillar plate on the mounting ring and secure in place with the three or four mounting screws. Remember that all screws in a chronometer must be screwed home securely.

On instruments fitted with a lower bar train bridge turn the pillar plate over and secure the bridge in place. See Figure 6. Then turn the movement over and set it in the bowl, making certain that the alignment pin protruding beyond the movement ring or pillar plate enters the slot in the edge of the bowl.

Then place the third wheel, center wheel, fourth wheel and maintaining pawl in their respective pivot holes. On some chronometers the fusee and escape wheel are also housed

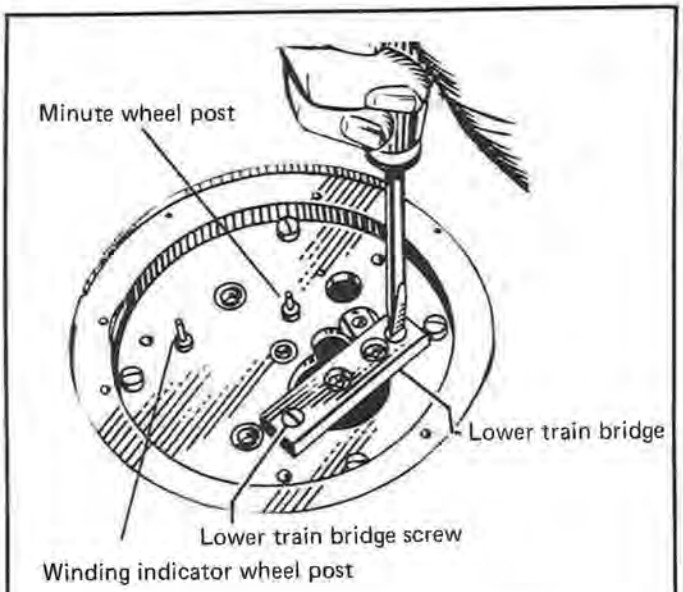

Figure 6. Assembling drive train bridge.

under the train bridge. If this is so, the fusee and escape wheel must be put in place at this time. In positioning the fusee, the maintaining pawl must be pulled back and away from the fusee as it is being set in place so the pawl will be able to work properly in the maintaining wheel.

On instruments such as the Hamilton that employ a train blocking screw which is located in the lower balance bridge, screw the train blocking screw into this bridge so that the cone part of the screw is below flush with the top surface of the lower balance bridge.

Next turn the upper train bridge over and secure the lower balance bridge to it. See Figure 7. In the Hamilton, turn the upper train bridge over and back up the train blocking screw to provide installation clearance. Place the upper train bridge over the pillar plate, and carefully lower it into position making certain that all pivots are properly in their holes and wheels and pinions are in mesh. Then secure the train bridge to the pillars.

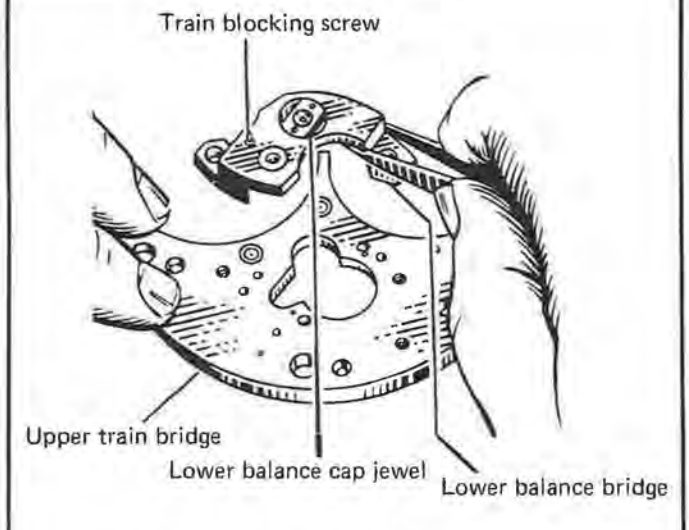

Figure 7. Assembling lower balance bridge to upper train bridge.

If the maintaining pawl has the tension spring attached, care must be taken to see that the upper end is fitted into the small hole near its upper pivot in the upper train bridge so it will not buckle or snap off. On other models employing the separate straight type of tension spring mounted in a screw, after the bridge is secured in place, the spring is inserted through a threaded hole directly above the pawl and screwed into position. In some of the very old chronometers the maintaining pawl spring is fitted to the underside of the pillar plate and thus, must be secured in position before the upper train bridge is put in place.

After assembling the train, the shakes should be checked and adjusted if necessary. In the Hamilton, this is much more easily done for if an end shake adjustment is necessary, all that has to be done is press one of the jewels setting or bushing in or out, as required. The shakes should be very close—end shakes from 0.001 to 0.003 in., side shakes from 0.001 to 0.0015 in.

Next place the barrel and fusee in place with the winding squares up. When positioning the fusee, take your tweezers and push the maintaining pawl aside so the fusee can be positioned properly. See Figure 8. Then carefully place and secure the barrel bridge in position and check the shakes which should be very close.

With the fusee and maintaining pawl installed, check to see if the point of the pawl engages the teeth properly and that there is clearance between it and the chain and the fusee wheel. The maintaining pawl should be free to move with very

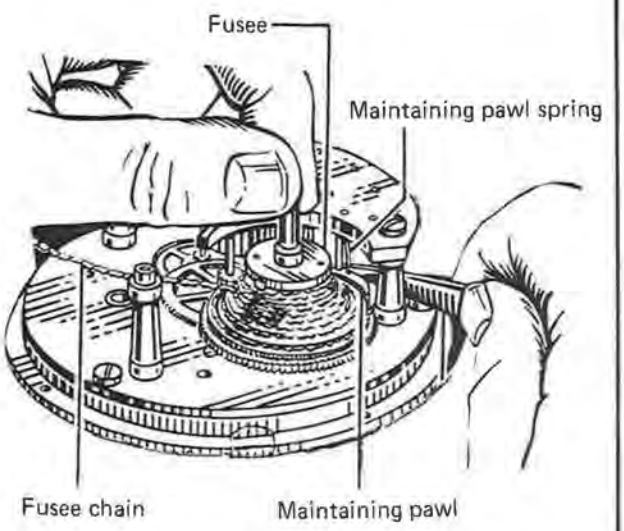

Figure 8. Positioning fusee in movement.

little end shake. The spring which acts on the pawl must not exert too much pressure, just enough to keep the pawl positively engaged into the maintaining ratchet wheel teeth.

After final assembly of the train and power assemblies, all upper and lower train jewels and bushing should be carefully oiled. See Figure 9. The point of the oiler should contact the bottom of the jewel or bushing oil cup and the pivot simultaneously. When oiling the lower center wheel bearing, a small drop of oil is placed on the sides of the upper post of the center wheel so the cannon pinion will not freeze and assure smoother setting of the hands. A lighter or medium type of oil may be used on the train wheels while a heavier

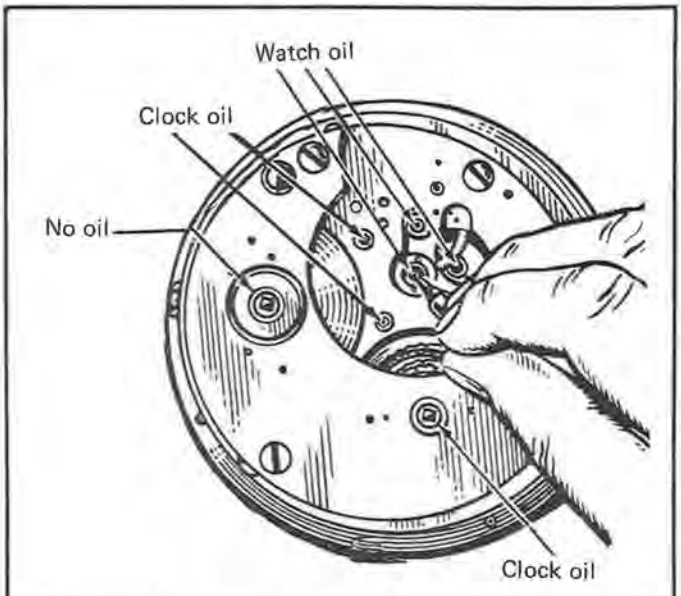

Figure 9. Oiling the assembled movement. Note that no oil is required on the upper and lower barrel arbor pivots.

type is more apropos for the fusee. No oil is required on the barrel arbor bearing working in the plates because the only time the arbor is turned is during set up and when removing the power during disassembly.

Next month, the reassembling discussion will continue with an installment on setting up the mainspring and escapement. □

Essence of Clock Repair

by Sean C. "Pat" Monk
CMW

Part XXXVIII

THE FRENCH MANTEL CLOCK "RACK AND SNAIL" circa 1889

In our previous article, we discussed a French mantel clock of related vintage and also of a somewhat related striking mechanism. The difference between the two movements is that the ormolu, previously discussed, has a count wheel striking mechanism. Our present subject has its striking mechanism controlled by what is commonly known as the rack and snail, or more technically, the rack and gatherer. Otherwise, the 8-day time trains of the two clocks are very similar.

Our rack and snail clock is shown in Figure 1. The clock is of the French crystal regulator type, having bevelled glass on four sides and a mercury pendulum. Our movement is marked with the numeral 4 on the right hand lower back plate. The 4 denotes the French linear measurement of 4 pouces, where 1 pouce equals 1.0657 inches. The measurement itself represents the effective pendulum length. The clock is of the 8-day variety, striking the full hours and one bell at each half-hour. It is circa 1889 and manufactured under the name of the well known French company, S. Marti & Cie.

The hour strike. As the minute hand comes to the warning (previously described in last month's article), the

Figure 1.

lifting-unlocking lever (*a* in Figure 2) via its lower arm, is lifted by one of two pins on the cannon pinion. We shall refer to these pins again shortly. A release flag, at the end of the upper arm of this lever, which protrudes through a hole in the front plate, temporarily frees the strike train. Warning commences. At the same time as this occurs a gate is freed from the warning wheel pin. The warning wheel is situated next to the fan, or fly. This lifting action of the lifting-unlocking lever also frees a pin on the rack hook (*b* in Figure 2). In so doing it frees a steel stop lever which frees an arrest

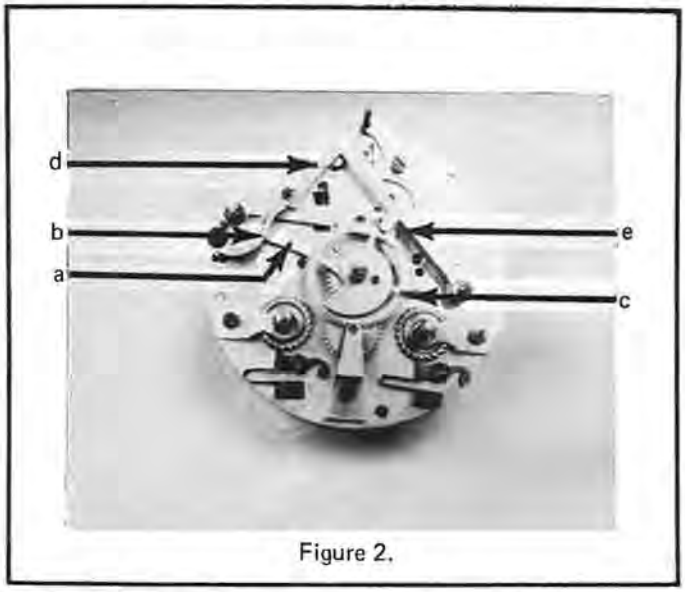

Figure 2.

pin on the stop wheel. The stop wheel is set in the plates next to the warning wheel, the latter being next to the fan. This allows the warning wheel to rotate until arrested, when a steel pin attached to it contacts the arresting gate. This completes the warning.

The strike is now ready. When the minute hand finally reaches the hour at the high point lift of the cannon pinion pin (the pin which is closest to the perimeter of the cannon pinion), it lifts the lifting-unlocking lever to its high point. This action allows the gate to fall. This frees the warning wheel completely and the strike commences.

The cannon pinion. Before referring to the half-hour strike, let us talk about the importance of the cannon pinion.

The cannon pinon is frictionally-attached to the center arbor. Incidentally, this frictional attachment should be neither too loose (causing slippage of the hands) nor so

tight as to jam the striking train. The cannon pinion, situated immediately behind the hour wheel (with its hour snail permanently attached, see *c* in Figure 2) has two unlocking pins on its underside. The hour strike, which we have briefly described, is effected only when the pin closest to the perimeter on the cannon pinon comes into contact with the lifting-unlocking lever, lifting it to its high point. Only at this high point of lift can the rack itself (*d* in Figure 2) be freed sufficiently to allow the hour strike to occur. The number of hours struck (see last month's article, count wheel movement) is controlled by the engagement of the rack tail (*e* in Figure 2) with a segment of the hour wheel snail.

The half-hour strike is controlled by the pin on the cannon pinion which is closest to the center of the cannon pinion. When this pin raises the lifting-unlocking lever by a smaller amount than the other pin does at the hour, the amount of lift is only sufficient to raise the lifting-unlocking lever enough to free the rack hook to minimally disengage the strike train. Perhaps we should explain it this way: the clearance at this slight lift between the rack hook and the rack is only enough to free the stop lever without allowing the rack to fall. However, this movement is sufficient to allow the warning wheel to rotate one-half turn. The lifting-unlocking lever moves just enough to raise and drop the hammer tail. This is sufficient for one strike on the gong. When this action is concluded, however, the lifting-unlocking lever falls back again to its normal position. The rack hook with its stop lever returns to its normal position, arresting the pin on the stop wheel.

We shall talk more about the two types of French striking clocks in future articles.

In finality, it should be observed that fine regulation of the clock (as in the count wheel type) is done from the front at the top of the dial. A double-ended key is (or was) provided by the manufacturers. A double steel suspension spring is moved up, or down, to raise or lower the pendulum. A gear, meshing with a horizontal gear above the suspension system, effects this adjustment upon use of the small end of the key. The large key end, of course, is for winding the two clock mainsprings, time and strike.

The mercury pendulum is arranged for temperature compensation, using two glass vials (Figure 1). The main regulation is achieved by adjusting the height of the pendulum by an adjusting screw on the bottle containing the glass vials. □

Inside the Clock Shop

with James L. Tigner

THE GRAHAM DEAD BEAT ESCAPEMENT
Part 3—Making a New Pallet

In making a new Graham dead beat pallet the old pallet can often be used as a pattern. This is because the worn grooves, even though very deep, usually occur along the center line of the acting faces, whose edges are, as a general rule, still intact for tracing.

Before duplicating an old pallet, however, its action in the escapement should be studied carefully, so that modifications can be made to the new one, if needed. For example, if the drops appear much too large, it must be decided whether the error is due entirely to the worn grooves, or whether part of it is attributable to the locking faces having been dressed down sometime in the past. Or, if the escapement mislocks, is it solely because of the grooves, or partly because the impulse faces have at one time also been ground?

Should you decide on the latter possibility in both examples, you would want to allow a little extra metal for adjustment in the final fitting. A review of Parts 1 and 2 in this series might be helpful in arriving at a decision.

In the event the old pallet is too mutilated to serve as a pattern, or is missing altogether, a new one must be designed and drawn, which can be done by following the instructions in Part 1. The constructional details are again shown, on a reduced scale, in Figure 1.

Draw only the pallet, not the escape wheel, and omit the constructional lines. This can best be done directly on the piece of steel from which the pallet is to be made, after it has been brushed with Dykem Steel Blue, or any other layout dye carried by industrial supply houses. If there are no such places in your locality, nail polish will do very nicely.

Prick punch the centers of both the pallet and escape wheel in order to provide fixed locations from which to swing arcs and measure distances. It's not necessary to buy steel wider than needed for the pallet, but it will prove helpful if a second strip is placed below the pallet stock, and the two are fastened to the drawing board with masking tape. This keeps the escape wheel center at the same elevation and makes for greater ease and accuracy in measurements.

All dead beat escapements, of course, aren't of the square design, where the pallets embrace 7½ teeth and the center distance equals 1.414 times the escape wheel radius. In fact, the pallet we will be making, and whose design is common, embraces 9½ teeth and is intended for an escapement with a center distance equal to the diameter of the escape wheel.

Perhaps this would be a good place to clarify that while pallets, of necessity, must always embrace, or span, wheel teeth in half numbers, authorities often refer to these figures in whole numbers. When they do, they always mean the number of teeth between the pallets with the escapement locked on the exit pallet. Thus, a span of 7½ teeth is frequently called 8, and 9½ called 10.

With that bit of digression out of the way, let's get on with how to design a pallet that's missing. First, measure the diameter of the escape wheel, and then the center distance between the pallet and escape wheel. The latter distance can be measured quite accurately by placing the caliper jaws over the respective wheel and pallet pivots where they extend through the front plate. The reading thus obtained, less the sum of the two pivot radii, will be the center distance.

With these two measurements, the number of teeth to be spanned by the pallets can now be determined graphically. On a piece of paper swing the escape wheel circle. From its center draw a vertical line, and on it mark off the center distance, which also locates the pallet center. Now draw lines from this center tangent to the wheel circle, one line on each side of the center line. From the wheel center draw radii perpendicular to the two tangent lines, meeting them at the points of tangency. With a protractor measure the angle between the two radii.

This angle represents the part of the wheel circle to be embraced by the pallets. Multiply that fraction by 30 (the number of teeth in all seconds-beat pendulum clocks), and it will tell us the number of teeth to be spanned by the pallets.

As an example, suppose the angle formed by the two radii measures, as nearly as we can tell, 142°. Then 142°/360° X 30 = 11.8 (teeth). Now remember that all pallet spans must be in exact half teeth. And since 11½ teeth is the nearest half number to 11.8, 11½ has to be the number of teeth the pallets should span.

Now that we know the correct number of teeth to be embraced, we can work the problem backwards to find exactly what the angle between the two radii *should* have measured. 11½/30 X 360° = 138°. Lay off half of 138° on either side of the center line and draw the two radii, whose intersection points with the wheel circle mark the centers of the respective pallet impulse faces, just as lines *BE* and *BF* do in Figure 1. If the points of tangency of the two lines earlier drawn from the pallet center do not coincide with the intersection points just described, adjust them so that they do.

From here on the constructional details of the pallet are exactly the same described in Part 1 of the present series and illustrated in Figure 1.

Since we have been through all that before, we will make our pallet by tracing the old one, which we have decided is in good shape except for deeply worn grooves on the center lines of the acting faces. The first thing we need is some good steel with a high carbon content. We could use an old file or any other scrap or hardenable steel that might be handy.

But that is the way to waste time, and time is all that a clock repairman has to sell. Many suppliers listed in the AWI Sources Book and also Campbell Tools carry oil hardening, nondeforming, precision ground steel in 18 inch lengths with widths and thicknesses to suit any pallet made. Incidentally, if you buy steel for a missing pallet, a good thickness to buy is from 2 to 2½ times the thickness of the escape wheel.

When you have the correct steel in hand, cut off the needed length and drill it to fit the pallet arbor. Use a drill the next size smaller than the finished hole, and bore the hole to exact size with the stock held in a face plate or 4-jawed chuck, if either is available.

If not, a rat tail file will do an acceptable job. Work the file back and forth for fast removal of large quantities of metal, but when the hole approaches correct size, grip the file tang in a vise, slip the workpiece over the file as far as it will go, and turn it first clockwise and then counterclockwise, which will restore the roundness of the hole.

If the pallet is to be screwed to a collar on the arbor, open the hole from both sides of the stock, until a close fit is achieved with no side shake. But if the pallet is to be driven on to a tapered arbor for a press fit, round up and open the hole from only one side. Remember, though, that when the outline of the new pallet is scribed on the workpiece, it must be so oriented with the taper of the hole that when the pallet is mounted on its arbor, the locking faces will be toward the leading faces of the wheel teeth, and not the reverse. A glance at Figure 1 will make this clear.

Figure 2 shows the old pallet and the steel plate rigidly pinned together by a pointed piece of pegwood driven through both holes, which are of the exact same size. Under these conditions it's simple for a needle held in a pin vise,

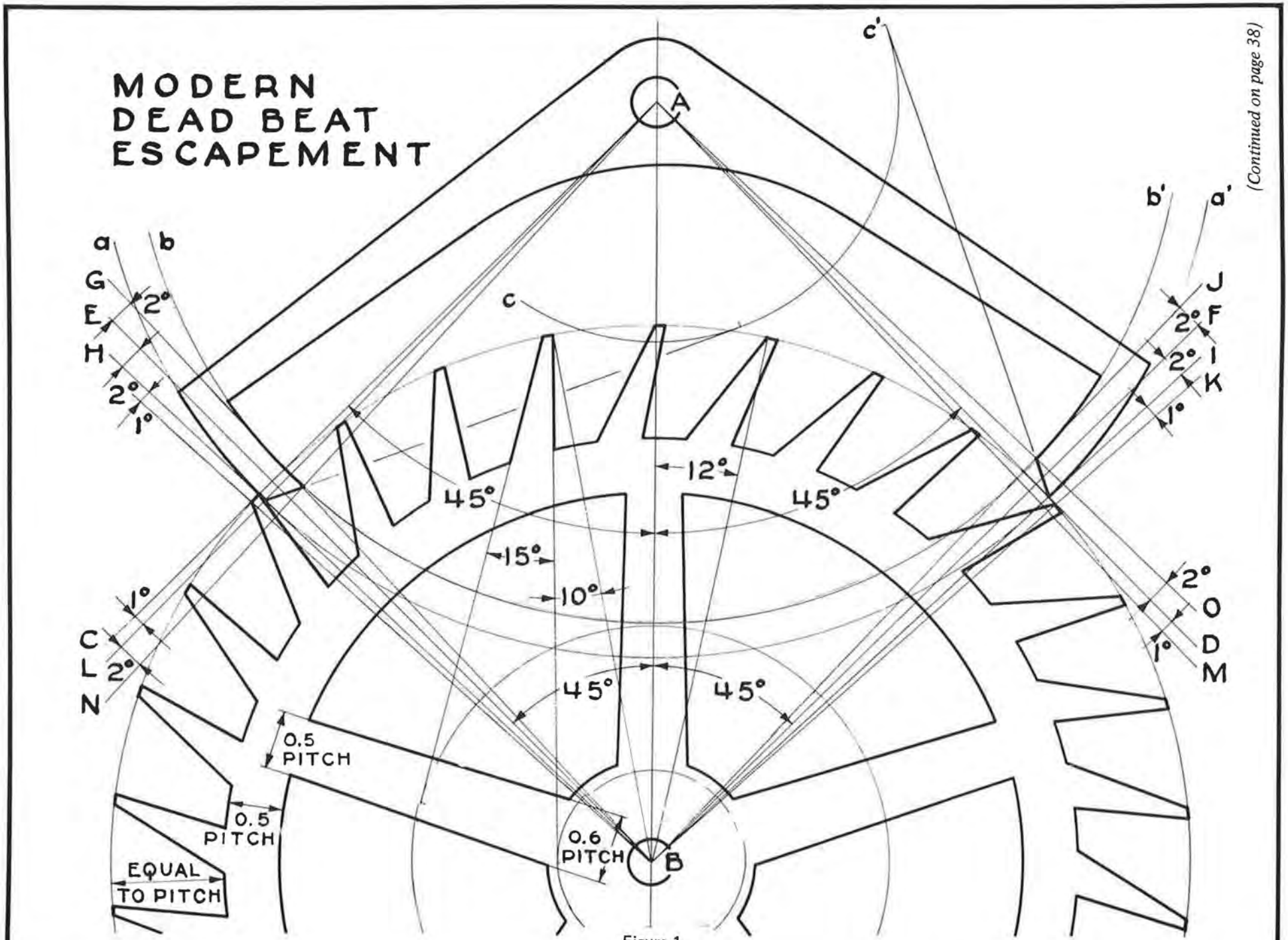

Figure 1.

(Continued on page 38)

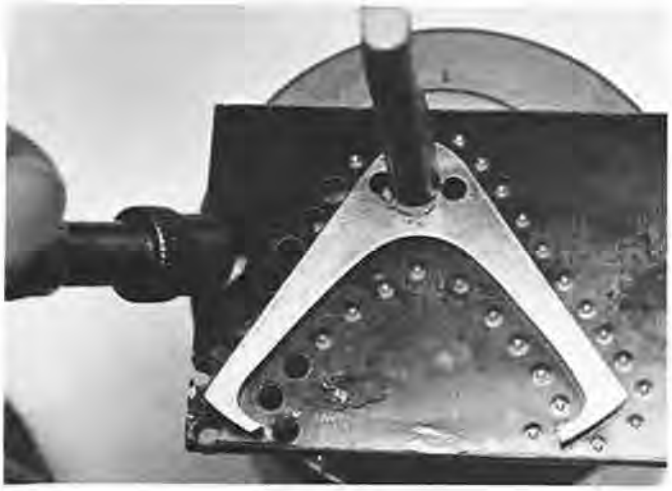

Figure 2.

as shown, to be used in tracing the outline of the old pallet without risk of its shifting. The punch marks and drilled holes, of course, were made after the old pallet was removed.

It's a good idea while the two pieces are still pinned together to turn up a pointed steel pin in the lathe for a close, sliding fit in the two screw holes that show in the photo. Harden and temper the point, place the pin successively in each of the holes, tap it smartly with a hammer—and two punch marks will be formed, perfectly centered for the new screw holes.

In Figure 3 we see how cleanly the blue Dykem delineates the needle point outline of the pallet. Lines such

(Continued on page 40)

AWI technical bulletins AWI hot line AWI bench courses AWI horological times AWI museum AWI employment service AWI films and slides AWI ad assistance AWI library AWI home study AWI certification AWI federal liason AWI scholarships AWI awards

AWI NEWS

By Milton C. Stevens

By now, all members, except those who joined AWI during this past year, have received their membership renewal statement for 1979. New members who joined AWI during 1978 will receive a statement near the anniversary date on which they joined AWI. This statement will be on a pro-rated basis in order to bring these people into the annual billing basis system. The general membership statements for 1979 reflect an unavoidable $5 increase in annual dues. This increase was approved by the Board of Directors during their annual meeting in June of this year.

AWI is doing its best to conserve funds, as does any prudent businessman. As all businessmen know, the cost of doing business increases every year in spite of all of the cost saving measures taken. In the past three years since our last increase in dues, costs have risen sharply. The modest increase voted this year reflects a "catch-up" situation which really doesn't free any additional funds for other worthwhile activities.

Every member can help AWI stretch these "catch-up" dollars by paying his annual dues promptly upon receipt of the statement. It costs AWI over $1,000 in postage alone to make a single first class mailing to all its members. This cost, of course, does not include the cost of paper, printing and envelopes, which is considerably high today, as well as the labor costs involved in addressing, stuffing, and handling a mailing of this magnitude. Elimination of the need to send second, third, and even fourth dues statements will result in considerable savings in an already tight no-nonsense budget.

As we have done each year previously, we have prepared a number of useful items which will be included in the 1979 membership renewal packets. The standard items include a membership card, yearly up-date decal for your window emblem, membership certificate, and the special AWI member one-half price subscription coupon for the AH&J magazine. In addition to these standard items, 1979 renewal packets will contain the following.

Supplemental Sources Book Pages

Since the Sources Book was published and distributed to AWI members last year, we have acquired many new and valuable sources for goods, services, and products for the watchmaker. We have compiled this information and will have it printed on pages which can be inserted into your blue and gold Sources Book. Since the reception and use of this book has been so favorable, we expect to completely revise it in 1979 and make an entirely new book available in 1980.

Library Catalog

A complete catalog of all library materials has been prepared for distribution. This catalog will provide each member with an up-to-date listing of all of the volumes in the AWI Library. Library items will be designated in two categories: (1) those items which can be circulated, and (b) those items which cannot be circulated, or which are restricted and require a substantial deposit.

The circulated items can be borrowed for thirty days by any AWI member in good standing. Members are requested to limit their requests to two books at any one time. Circulating items are those items of which we have multiple copies. Members borrowing books are responsible for their safe return or replacement.

Noncirculating items include one-of-a-kind or rare materials which are out of print and no longer available. Restricted materials in this category have been so identified and designated by the AWI Library Committee. Some restricted material may be circulated under special circumstances provided a sufficient deposit be made to insure its replacement in the event loss occurs.

Material Price List

One of the key factors in operating a profitable repair department is to know what your expenses are. A major cost in the repair department is the cost of material. A price list which will reflect material costs as of September 1, 1978 has been prepared. This list will give AWI repairmen an up-to-date reference on which to base their repair estimates.

Interchangeability

Many requests come to AWI every year for interchangeability information. The 1979 membership packet will include our first attempt to fill this important need. It will feature interchangeability information for many of the popular calibres of automatic, calendar and chronograph watches. As time and funds become available, we plan to expand this project into other types of watches. Considering just the cost of material alone, these lists will put the

(Continued on page 40)

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AFFILIATE CHAPTER COLUMN

by Willard Blakley CMW

This article will deal with something that is around most of us watchmakers most all the time. We keep wanting to get young blood into the field of watchmaking. I wonder just how much we really want young watchmakers. Are we willing to take time out to help the novice?

When I finished my training at the Gruen Watchmaking Institute in Cincinnati more years ago than I sometimes like to admit, I thought I was ready to take on most anything in the field of watchmaking. After only a short time I realized that I needed help. I will be forever grateful to an older, more experienced watchmaker who was willing to hire me, and my apprenticeship with this well qualified man gave me the good background that is so important to the training.

If we are to get the young to go into the field of watchmaking we must be willing and ready to help them when they finish the training at a watchmaking school. Our schools are doing a good job with the students, but as is true with any profession, it's the on-the-job training that really gives the experience.

I would like to share with you something that happened to me a few days ago. A young man approached me at one of the material houses and told me he didn't understand why he couldn't get any watch repair work to do. I had the misfortune to have to tell him that from all I had heard his work just didn't hold up. He has been out of school for several years now, but has never been able to work with an experienced watchmaker. Here is a young watchmaker who really wants to become a good watchmaker, but can't get the break he needs from the older repairman.

Let's give these young men and women some help when they finish school. Remember how hard it was for you when you finished your training in school, and the problems you had? How you wanted to do that major repair job or not being able to understand how to repair many watches? Well, due to the advancements in the field of horology, just magnify the problems you had when you were a new graduate from school and you will see that these graduates of today have even more problems to cope with than we did a few years ago. These people need our help. Let's give them the break they deserve.

Affiliate Chapters: When you have your workshops and you take pictures of the watchmakers at work, why not write a brief article about it and send some photos to be included in the Horological Times?

NEW YORK

As part of the Horological Society of New York's program of encouraging new recruits into the watch field, an award is given to honor graduates of watch repairing courses in the schools.

The award consists of two parts: (1) the name of the recipient is engraved on a plate mounted on a plaque and placed in permanent display in the school and (2) the honor student receives free membership into the Horological Society of New York for one year.

At graduation exercises each year the Society has presented such an award to the outstanding watch repair student of the George Westinghouse Vocational High School in memory of Dave Protos.

The Society has now extended its program to include the Joseph Bulova

Ben Lipton (left), Director of the Joseph Bulova School of Watchmaking receiving the RUDY PEZEL MEMORIAL PLAQUE from Irving Albert, President of the Horological Society of New York.

School of Watchmaking. The new award perpetuates the name of Rudy Pezel who worked tirelessly and unselfishly for many, many years on behalf of the Society.

At the October 9 meeting of the HSNY, Mr. Arthur S. Levine, Director of Personnel and Industrial Relations, Bulova Watch Company, was guest speaker. His topic was success and motivation as it applies to the individual personally and professionally. Mr. Levine has been a member of the American Management Association, the Joint Advisory Council to Small Business, the American Association of Industrial Management, and Industrial Relations Society. He has lectured and given seminars to corporate executives, middle management personnel, and business entrepreneurs.

He received BBA degrees in both Industrial Engineering and Industrial Psychology and his MBA degree in Human Resources. Mr. Levine has taught Business Management for over 18 years at the Baruch School of Business Administration of CUNY and currently at New York Institute of Technology.

TEXAS

On October 15 the Texas Watchmakers Association visited Heritage Garden Village in Woodville. The visit included a special look at the City of Houston Clock.

At the September 19 meeting, Dren Duffy presented a program on the fusee, covering the points a watchmaker needs to know in order to service this type of watch.

PENNSYLVANIA

Forty-five watchmakers attended the Solid State Seminar presented by Bob Nelson for AWI at the Holiday Inn in Pittsburgh. This was a one-day, 7-hour class, crammed with practical information about the operation and field service on LED and LCD watches. Mr. Nelson didn't dwell on solid state theory, but rather on the kind of things which one needs to know in order to make a buck on service. He pointed out these modules are nothing like the fine mechanisms that we are accustomed to repairing, but merely a plastic and electronic unit held together by solder and glue. Certainly, much technology has gone into their design and development, but repair certainly does not require a watchmaker's touch. The members left with a feeling of a day well spent, no longer afraid to open the case of a solid state watch. They should present an interesting diversion in repair—an intriguing departure from the daily grind of jewels, wheels, and pinions.

Robert Bishop, president of the Watchmakers Association of Pennsylvania has offered a few thoughts for consideration. Solid state watches, LED and LCD, cheap ones, good ones: what should we, as skilled watchmakers, do about them? There are some electronic firms in the area—not watchmakers—who have captured much of the solid state business by offering a module replacement plan. Apparently, business is so good that they are unable to provide the fast service that they did in the beginning. This situation presents an opportunity for us to enter this market and provide a service that both rightfully belongs to the professional watchmaker and can provide us with a source of profit. However, it is not something we can step into tomorrow. There are problems. First and foremost, we must understand solid state watches, their operation and problems, and what problems are within our capabilities. Training is the answer to this. Second, we must have a source of modules and parts, preferably through our material distributor. If enough of us indicate that we want to repair these watches, I am sure the material distributor will do his best to supply us. He works on the profit motive, too. As a result of our Solid State Workshop recently and the interest shown in enter-

ing this market by the vast majority of those attending, Ray Gaber Co. will actively try to obtain the products we need to give proper service to our customers. We learned at this seminar that only a small percentage of malfunctioning modules require replacement, but for those that are bad, a universal replacement module that will fit most any case and button placement is available and can be installed simply and quickly. AWI's instructor, Bob Nelson, believes that the customer should pay for our knowledge, not just how long it takes to do the job. This knowledge does not have to include the intricacies of electronic theory, but we must be able to see the problem, and make the necessary corrections. It is my belief that there is no longer a technological need for the mechanical watch. Electronic technology can do anything in the timekeeping field better and, in most cases, cheaper, than mechanical technology. Of course, that does not mean that mechanical watches will not be made for a long time, but the potential is there. We must adapt. Don't be afraid to take on this new field. The water isn't as cold as it seems.

The Delaware Valley Guild held a meeting on September 18. A report on watch part prices was given by Al Schwartz of Barton & Chase. A discussion was then held on price structure for trade work and retail work. Members were asked to submit anonymously their price lists, and these were read and discussed.

At their October 16 meeting, the Delaware Vally Guild heard a program by Mr. Bill Hilliard, general manager of Microsonic, on servicing solid state watches.

The Allegheny Guild held a meeting on October 10 in Pittsburgh. Ray Gaber Co. presented a program.

OHIO

The Cincinnati Watchmakers Guild held a meeting on October 25. The topic was water resistant watches.

CALIFORNIA

The President of the American Watchmakers Institute, Mr. Orville R. Hagans, addressed the Bay Area Watchmakers Guild at the Doubletree Inn in Monterey, California. This event on September 16 and 17 was well attended by members from as far away as Redding and Sacramento as well as the entire Bay Area.

After a lifetime devoted to horology, Mr. Hagans, at 82, spoke enthusiastically about the opportunities before the present generation of watchmakers to improve skills, master the quartz revolution and thereby serve the public. This will in turn result in greater personal satisfaction and increased income.

L-R: Orville R. Hagans, AWI President, Mrs. Fryday, Mrs. Crosby, Don Crosby, and Harold Fryday, President - Bay Area Watchmakers Guild.

Don Crosby was the generous and amiable host to this event, the first of its kind for the Bay Area Watchmakers Guild. The weekend began with a golf tournament on Saturday morning. Other members toured the Monterey area, a scenic place indeed.

Saturday evening, the group gathered for dinner. At the cocktail hour the members had an opportunity to meet with Orville Hagans and with each other. After a fine dinner, Mr. Hagans' presentation emphasized that watchmakers themselves are the greatest obstacle to earning a proper living. His delivery was dynamic and his message provocative.

He related AWI's history and emphasized that the western membership now plays an important role in the future of watchmaking. Then Mr. Hagans showed a U.S. Time film which revealed some unique and beautiful timepieces made during the last six centuries. Orville described some of the collections he has been privileged to see through the years. He also showed a film of the renovation

WAO Board Members Elect being sworn into office at the annual meeting in July, 1978. L-R: Robert Allis, Jack St. Cyr, James Broughton, Al Brehl, Ralph Giantonio. Don Basch, WAO Past President, administers the oath of office.

of the Empress, a clock he had the challenge of rebuilding. This clock was originally given to Josephine by Emperor Napoleon. The conclusion of this meeting was highlighted by the circulation of a number of watches from Orville's private collection.

The Guild thanks Don Crosby for his time and energy in organizing this event, and thanks Mr. and Mrs. Hagans for visiting.

One hundred eight-five members of the Horological Association of California were honored to have as their guest speaker for the September 12 meeting in Los Angeles the world famous horologist Orville Hagans. Mr. Hagans has spent 71 years at the bench, 46 years in association work (currently President of AWI), writes monthly for three foreign publications, 6 U.S. publications, contributes to one encyclopedia, and is a renowned collector. Mr. Hagans shared with HAC his vast knowledge, and helped increase each member's self-respect for the watchmaking profession.

Mr. Hagans' formula for success: Be a professional. To be a professional he prescribed knowledge. This knowledge can be obtained in many ways, but an essential element is reading. "If you will give fifteen minutes a day to reading something about your profession," says Mr. Hagans, "you will enjoy your profession more and become more a part of an industry that has given more to science than any other profession in the world." "The history of time . . . there is nothing more fascinating." Attend seminars and take advantage of association services and activities. Learn how to handle people and how to sell a repair job. A theme that rang loud and clear throughout Mr. Hagans' oratory was the idea that a watchmaker is a professional. And "Why shouldn't we be on the same plane as other professional men?" Do as the doctors and lawyers do, advises Mr. Hagans. "charge for your knowledge plus your work."

Mr. Hagans showed two exceptional films during the program. The first film featured the almost unbelievable U.S. Time Corporation collection of watches. Watches in the collection were made by famous makers such as Peter Heinlen, Thomas Tompion, Abraham Breguet, and many others.

The second film featured the Empress Josephine Clock. The clock was made by the French clockmaker deBelle and given to Empress Josephine by Napoleon. In time the clock found its way to the United States, but unfortunately was in a most dilapidated, non-working condition. Mr. Hagans had the gratification of being selected to restore this highly complicated, animated fusee-powered timepiece.

Mr. Hagans then concluded his presentation with these words, "I love my profession. . it has been good to me." This appreciation and enthusiasm for one's profession is essential. And HAC thanks Orville Hagans for giving his time to instill a greater feeling of pride in the watchmaking profession and in turn help the watchmaker rise to greater heights.

L-R: Mrs. Hagans, Mrs. Foreman, Jay Foreman, HAC President.

ILLINOIS

The first fall meeting of the Central Illinois Watchmakers Association was held on September 21 in Bloomington. Bill Wease of Peoria discussed "Production methods in watch repair and jewelry making."

VIRGINIA

The Potomac Guild held a meeting on October 10, at which Officer Karl Holsberg spoke on "Security in Our Homes and Business."

The Tri-City Triangle Guild held its monthly meeting on October 17, which featured "Lady's Night." A film entitled, "A Rainbow of Colors," provided by the American Gem Society, was shown.

NEW JERSEY

September was Seiko month for New Jersey Watchmakers' Association. At the regular monthly meeting in Clark, Jack Schecter, manager of technical services for the Seiko Time Corp., presented his new program, "The Digital Explosion." Schecter packed a lot of information into his slide lecture which showed not only the intricacies of digitals, but also a lot of what goes into the manufacture of these watches at the Seiko factory in Japan.

Assisting in the presentation were Donald Ganz and Elmer Daves, sales representatives of Northeast Watch Company, so Jersey watchmakers really had a chance to get acquainted with the men they do business with in handling Seiko watches.

Jack Schecter's presentation was a first-rate warm-up for those Jersey members who took the Seiko bench course on September 24. The course was

(Continued on page 47)

BENCH TIPS

with Joe Crooks

Streaking is a new term for fast beat, inexpensive watches with three-prong plated balance wheels and no timing screws, which run so fast that they cannot be slowed down enough to keep time with the regulator all the way to slow after being cleaned by your normal method.

If you have not already experienced this problem, you will sooner than later.

It seems that most cleaning solutions with ammonia remove the plating in a normal cleaning procedure and the reduced weight of the balance wheel makes the watch "streak."

The safest method for cleaning these watches (if the balance wheel has not been deplated before you service it) is to hand clean the balance wheel in one dip.

If the balance wheel has been deplated by you or some other watchmaker before you received the watch to repair, you have two alternatives to stop the streaking:

(1) Replace the complete balance wheel with a new one.

(2) Do a little "professional botchery" by cementing three timing washers on the balance rim at each arm, with aron alpha, and then poise the balance wheel to make the botchery professional.

Take your choice, this is all you can do to stop streaking.

A tip to make a hairspring untangling tool from a safety match box was submitted by Harold B. Neill, Houston Technical College, 1301 Waugh Drive, Houston, Texas 77019.

Use an empty small match box, onion skin paper to fit the inside bottom of the box, and several concave staking set punches.

Cut out most of the bottom of the box, leaving just enough of the bottom to glue the onion skin paper to the inside bottom.

Glue onion skin paper to the inside bottom of box.

Use several sizes of staking punches that have a concave nose; make several holes in the paper by resting the paper on a support such as aluminum or brass, and you will obtain a smooth hole.

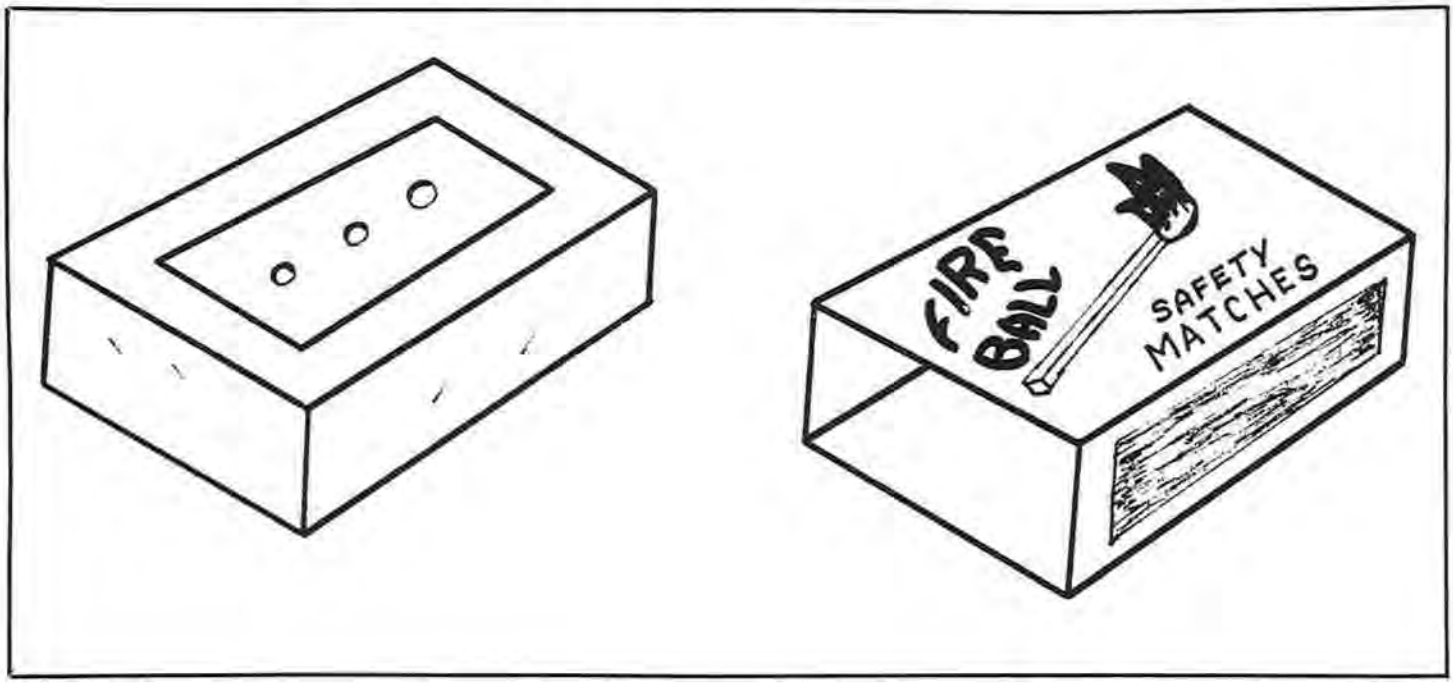
To use the hairspring untangling box, place the hairspring outside the box and the collet over a hole that is 1½ to 2 times the diameter of the collet.

Gently push the collet through the hole just enough to hang the collet on the inside of the box. Always push the area of the collet that is opposite where the hairspring is pinned through the hole first.

Using No. 5 Dumont tweezers, start to pull the spring through the hole using a "milking" motion on the coil.

When tangled portion appears in the hole, stop pulling the spring through and turn the box over and you will have both hands free to untangle the spring and the paper and box will make a good platform for a work area.

Mr. Neill suggests you pull a few springs that are not tangled through the box to get the hang of it. When pulling an overcoil spring through, stop pulling when you reach the overcoil and turn the box over and push the rest of the spring through the hole.



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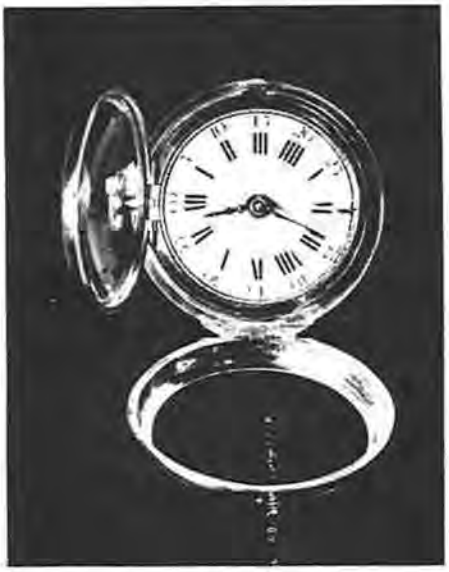
NEW MEMBERS

ALLEN, Thomas N.–Quincy, IL
AVEY, Irven–Topeka, KS
BEAR, Buddy Jeweler –Merion, PA
BIFULCO, Wayne A.–Staten Island, NY
BOLENDER, Arnold–Fairborn, OH
CALI, David C.–Rochester, NY
CARRIER, Clifford W.–Richmond, VA
CASEY, Terry–Grand Rapids, MI
CAVAZOS, Arnulfo–Paris, TX
CLARK, Charles R.–Beverly Hills, CA
CLARK, Herschel W.–Westville, OK
CLEMENTS, Steve P.–Madisonville, KY
CRUM, Fred N.–St. Francis, KS
DEBRICK, Joseph C.–Orange, CA
DUTTON, Robert W.–Denville, NJ
FISHKOW, Harold–Stamford, CT
FOLKERTSMA, James P.–Kalamazoo, MI
GIL, Miguel–Santa Ana, CA
HARKIN, Thomas E.–Costa Mesa, CA
HECKMAN, Donald W.–Chesapeake, VA
HEINZ, Kenneth–Marion, KS
HIGGINS, Harland–Coweta, OK
HOLLETT, Joseph H.–Salinas, CA
HOWELL, Glenn B. Jr.–San Antonio, TX
JAUCH, Fred W.–Pittsburgh, PA
JOHNSON, Alfred D.–Marshall, TX
JOHNSON, Craig–Paris, TX
JOHNSON, Noel W.–Monterey, CA
JURMU, Carl–Detroit, MI
KAPRIELIAN, Garbis–Montreal, Quebec
KIM, Sang J.–McLean, VA
LAMB, James V.–Columbia, MO
LEIRER, Gordon H.–Moline, IL
LIGHTMAN, Irwin M.–Milton, MA
MALONE, James E.–N. Canton–OH
MATSUDO, Jorge J.–Covina, CA
McMILLAN, J.D.–Gainesville, FL
MILLER, David A.–Albuquerque, NM
MILLER, Don–Park Ridge, IL
MONDORE, Clarence R.–Aurora, CO
MOORE, Victor L.–Phoenix, AZ
NEED, Perry–Indianapolis, IN
OLSON, Dean A.–Rockford, IL
ROBINSON, Gaither E.–Monrovia, CA
ROYAEL, Marion–Fort Lauderdale, FL
SCOTT, John C.–APO, NY
SIECKE, Martin–Toms River, NJ
SIEGFRIED, Charles G.–Tucson, AZ
SMITH, William F.–Austin, TX
STRADER, William S.–Morgantown, WV
WERNSTROM, August–Grand Haven, MI
WILCOX, Woodrow W.–Tavares, FL
WILE, Dean A.–Paris, TX
WILSON, Millard N.–Chesapeake, VA
WOLTZ, D.O.–Pensacola, FL
WOOD, Albert G.–Venice, FL
YAX, Donald–Howell, MI
ZORNAN, Daniel M.–Ligonier, PA

S-115.

S-116.



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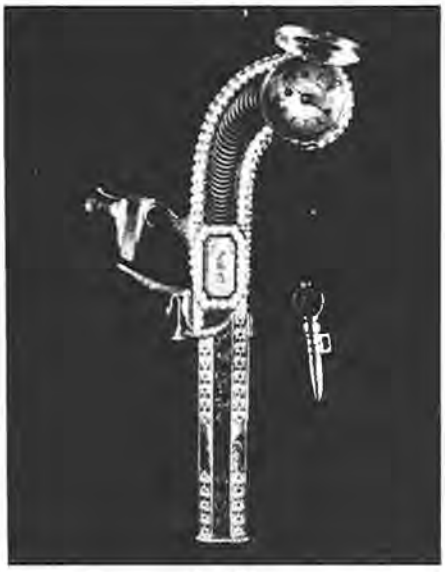


S-120.

S-115—Shows back of case engraved with religious symbols. Balance wheel is visible through a glass covered lid at bottom of case. The two circles at center of case are dust-protected keyholes. Verge escapement.

S-116—Round gilt-metal watch with crystal front lid and deep cup-shaped back lid of crystal. Three silver ring dials, showing time, date of month, and age and phases of the moon. Small side dials show days of the week and signs of zodiac.

S-117—Clearly shows the name of the maker, Estienne Ester, of Geneva. The balance cock is of silver. Also the ratchet-click. Middle 17th century.

S-118—22-karat gold cased watch, white enameled dial, steel cut hands.

S-119—Shows the beautiful hand-engraved and cut balance cock and regulator guides and small diamond end stone with steel setting. Verge escapement; chain and fusee drive. This watch bears the engraved signature of George Graham, of London, one of England's foremost horologists. He was born in 1673, died in 1751, and is buried in Westminster Abbey.

S-120—Pistol watch (with key) of red and blue enamel, inlaid with gold and studded with pearls. Movement, which has a verge escapement, with chain and fusee drive, is set in butt.

S-121—Shows the pistol after the trigger has been pulled. This causes a metal flower, whose heart is a perforated center piece, to spring open from the muzzle and release an odor of perfume. This was commonly known as a "love pistol."

S-121.

S-122—Gold case watch with center seconds hand and three dials showing hour, day of week and date of month. White enamel dial with blue enamel border; minute marks inlaid with gold.

S-123—Shows the movement, which has a verge escapement, silver regulator dial, chain and fusee drive. The name of the maker, Berthoud, of Geneva, is clearly shown on dial and top plate.

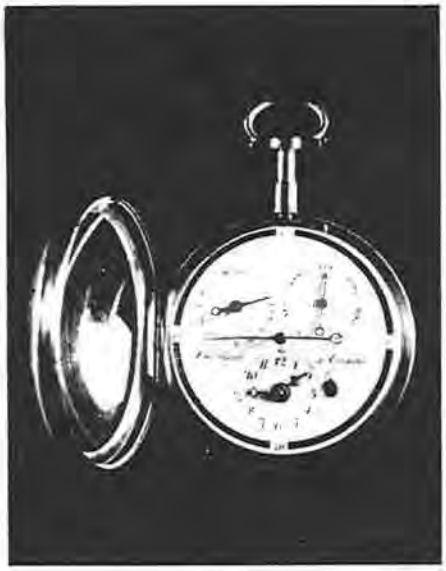
S-124—Gold case; center-seconds hand; maker's name on dial, Robert & Courvoisier, Geneva (1790—1800).

S-125—Shows the large balance wheel, which is approximately three-quarters the size of the watch's diameter. The hairspring is one-third the diameter of the balance. The balance cock is part of the engraved ring around the top plate. The escapement is of the pin wheel type and gives one-second impulses.

S-126—Silver case quarter repeater and alarm watch, alarm and time wound through dial. The repeater works by pressing plunger at top of pendant.

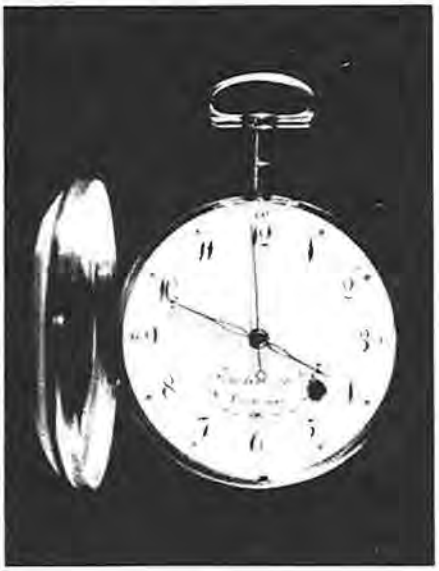
S-127—Shows back of watch with lid open. Perforations permit sound of the bell to be heard distinctly. Bell is screwed to inner case. Cylinder escapement; chain and fusee drive. Made by Courvoisier and Company, Switzerland.

S-128—Gold case quarter repeater. The arms of the three figures on the dial move as if striking the bells when watch is giving the time.



S-122.

S-123.



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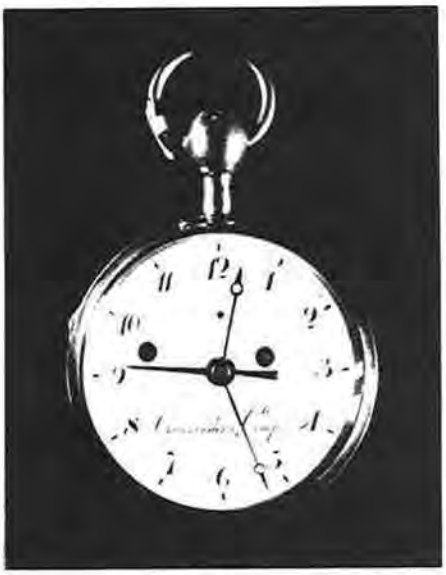

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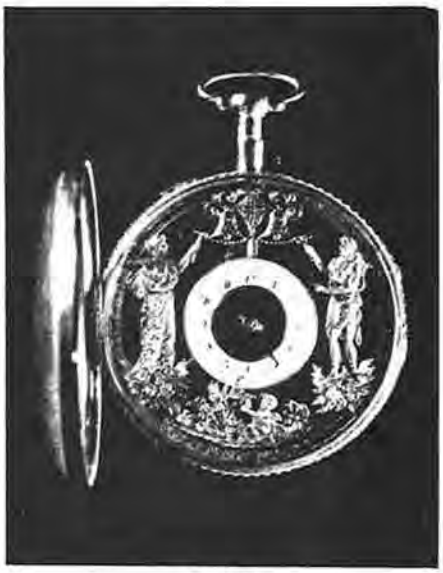


S-128.

S-129.

S-130.

S-131.

S-132.

S-133.

S-134.

S-135.

S-129—Shows the solid steel balance and silver regulator dial. Cylinder escapement, chain and fusee. Made by Meuron, Paris, late in the 18th century.

S-130—Shows nickel improvised case, white enamel dial, minutes and hours separate as shown.

S-131—Shows brass balance wheel with compensated regulator. Cylinder escapement, chain and fusee drive. Made by Jean Henry Seyffert, about 1840.

S-132—Double silver cased watch. White enamel convex dial. Second and minute circles of the same diameter.

S133—Shows movement out of case. Pierced and engraved balance cock and regulator guide. Verge escapement; chain and fusee drive. Made by John Ford, London, about 1780.

S-134—In a gilt bronze case. Gilt dial; heavily enameled raised figures. Steel cut hands enameled blue. Strikes hours and quarters by pressing plunger at top of pendant.

S-135—Shows movement and bell. Balance cock and regulator dial of silver. Made by Vergo, Paris, circa 1730.

S-136—Watch with four separate silver cases, the third case having an outer covering of tortoise shell. White enamel dial with Turkish numerals. Steel hands.

S-137—Shows inner case with movement. Balance cock, regulator guide and pillars pierced and engraved. Verge escapement; chain and fusee drive. Made by Edward Prior, London, 1800—1830. Prior, a maker of repute, was particularly known for his watches made for the Turkish trade.

S-138—Is a double cased silver watch, outer case repousse. Center half of dial is scene in colored enamel. Hands are of brass, pierced and engraved.

S-139—Shows inner case hinged to movement. Balance cock, regulator guide and pillars pierced and engraved. Verge escapement; chain and fusee drive. Made by James Segrut about 1764.

S-136.

S-137.

S-138.

S-139.

□

TAX BILL CLEARS HOUSE

After months of bitter infighting, the House pieced together a $16.3 billion tax cut providing several tax breaks aimed specifically at small business. The provisions in the bill for small business include a reduction in the corporate tax rate; an increase to 25% in first-year depreciation allowance; liberalization of the 10% investment tax credit; and a reduction in the maximum tax on capial gains from 49% to 35%. The Senate is likely to make even more extensive tax cuts thereby risking a Presidential veto. The tax writing process in Congress is clearly beginning to show the influence of the Proposition 13 vote in California earlier in the year. For the first time in over a decade, Congress is deliberately setting up some tax preferences for middle class taxpayers and small business.

(From the RJA Bulletin.)

AWI NEWS

(Continued from page 26)

watchmaker in an advantageous position because it will enable him to take advantage of the quantity price when purchasing material which is popularly used. It will also offer the advantage of being able to use material already in stock and eliminate the waste often experienced while material is ordered in.

AWI Membership Services

The 1979 renewal packet will include a comprehensive listing of all materials and membership services offered by AWI. This will include such items as advertising materials, books, lessons, drawings, kits, rings, watch pins, emblems, jackets and other educational materials.

Technical Bulletin Index

Supplemental pages listing the technical bulletins added this year to the AWI master files will be provided for insertion in the Technical Bulletin Index which was sent to all members last year.

In an effort to tailor AWI's future activities to meet the needs of its total membership, 1979 renewal packets will include a simple questionnaire which was suggested by the Affiliate Chapters and approved by the AWI Board of Directors. Everyone is keenly aware of the rapid changes which have taken place in our industry in recent years. The information we receive in anonymous form will set the future course for AWI activity and programs. Prompt attention to this questionnaire will be greatly appreciated. □

INSIDE THE CLOCK SHOP

(Continued from page 25)

as this make it possible to fabricate a highly respectable pallet, using nothing but hand tools, which is the aim of our present exercise.

By drilling holes around the tracing, as shown in process, the work of sawing out the pallet is considerably

Figure 3.

speeded up and lightened. But unless a power drill of some sort is available, it's faster and easier to do the whole job with just a jewelers saw.

Filing follows the completion of sawing, and for the most part it is done with the pallet held in a vice. An 8-inch, double cut, flat, bastard file will remove most of the excess metal in short order, with suitably sized round and half round files handling the inside curves. Except for the nibs, take the metal all the way down to the line, finishing up with progressively finer files, which are held by both hands in the draw filing position—the files at right angles to the back and forth direction of the strokes, which aids in maintaining a flat, square, smooth surface.

The nibs should be left slightly oversize for testing in the movement. To facilitate the test, a press fitted pallet should be driven permanently into place on its arbor at this point. A detachable pallet, like the one we are making, is best removed between trials, since the work of further dressing down is more easily done that way.

Dependent on the trial results, the pallet widths can be reduced to provide more drop, the pallets raised or lowered to equalize drops, the impulse planes filed back to reduce locks, the pallets bent inward to increase lock, the angle of the impulse planes changed to equalize locks—full descriptions of which were detailed in Part 2 on repairs.

When adjustments have reached the point where the escapement is operable, but with drops just a bit tight and locks a trifle heavy, harden the pallets one at a time by heating (just the nibs) to a cherry red and quenching vertically in light oil, which minimizes risk of distortion. A light motor oil is fine, but any other light oil will do.

To temper the pallets, first brighten with 4/0 emery paper one of the flat sides of each nib, so that color changes can readily be seen. Under good light, carefully heat each nib separately over an alcohol lamp, and plunge into water the instant a light straw color is reached.

The final finishing is done with emery sticks, beginning with No. 2 for smoothing out the file marks and ending with 4/0 for polishing. The most difficult area to get at is the inside curves of the nibs, which I reach with emery paper cemented to small sticks of wood shaped to suit.

Admittedly, the final stages of finishing a pallet by hand, including the filing, are time consuming.

Next month, for those who own a slide rest, *The Shop* will talk about a simple and easily made attachment for speeding up these last steps, while raising them at the same time to a level of high precision. □

NEWS IN THE TRADE

DOUBLE EAGLE II BALLOONISTS CROSS ATLANTIC WITH BULOVA

Soar from Maine to Paris 51 Years after Lindbergh, Who Also Wore a Bulova; Land Near Where Ben Franklin Saw First Balloon Flight in 1783; Albuquerque Jeweler Ernest Butterfield Provided Accutron Watches to Abruzzo and Anderson

Ben Franklin would have loved it. Three American balloonists from Albuquerque, NM landed near Paris, where Ben Franklin attended the first flight of a hot air baloon in 1783 while serving as America's first diplomat–completing the first transatlantic balloon flight. The balloonists did it on Daylight Saving Time, which Ben Franklin first proposed while he served in Paris (he was unsuccessful).

Two of the three balloonists, Ben Abruzzo and Maxie Anderson, later reported that their balloon, the *Double Eagle II*, touched down August 17 at 11:50 a.m. Mountain Daylight Time–Albuquerque time. They were wearing the Bulova Accutron Quartz watches presented to them by Albuquerque jeweler Ernest Butterfield. The third balloonist, Larry Newman, had his Bulova Accutron Quartz watch presented to him by Mr. Butterfield upon his return home later.

The historic balloon flight came 51 years after Charles Lindbergh completed the first transatlantic powered flight in the *Spirit of St. Louis on Saturday*, May 21, 1927, some 34 hours after leaving Roosevelt Field, outside New York City. Like Abruzzo and Maxie Anderson, Lindbergh was wearing a Bulova watch.

The flight of the *Double Eagle II* started in Presque Isle, Maine at 6:45 p.m. Eastern Daylight Time on August 11, making it probably the longest continuous transatlantic flight on record. The three balloonists returned to the United States August 25 in 3½ hours, aboard an Air France supersonic Concorde jet, after spending a week in Europe, most of it in Paris, after being hailed as heroes.

The news from Albuquerque was great, too. The city planned a heroes' welcome for them August 26 and the *Albuquerque Tribune* ran a *Double Eagle II* commemorative edition that day. In it was a special ad placed by Butterfield Jewelers–which sold out all the Bulova Accutron Quartz men's and women's watches Ernest Butterfield had in the store.

Butterfield's first ad saluting the *Double Eagle II* had run in the *Albuquerque Tribune* August 18, the day after the touchdown outside Paris. All Butterfield's Bulova Accutron Quartz watches had sold out afterwards–but a few days later his Christmas order shipment came in, encouraging him

The *Double Eagle II* as it reached France and crossed the coastline of Normandy on August 17, 1978, becoming the first manned balloon ever to cross the Atlantic–below are the hedgerows of Normandy that made headlines after D-Day in 1944. Aboard were Ben Abruzzo, Maxie Anderson, and Larry Newman, all of Albuquerque, NM. On the flight Mr. Abruzzo and Mr. Anderson were wearing the Bulova Accutron Quartz watches presented to them by Albuquerque jeweler Ernest Butterfield, for use on the transatlantic flight.

Albuquerque jeweler Ernest Butterfield (center) with *Double Eagle II* balloonists Ben Abruzzo (left) and Maxie Anderson (right) who display the Bulova Accutron Quartz watches they wore on their history-making transatlantic flight August 11-17. The watches had been presented to them by Mr. Butterfield for use on their flight.

to run the second *Double Eagle II* ad in the commemorative edition. Butterfield's has placed another rush order with Bulova for more Bulova Accutron Quartz watches.

In the meantime, apparently only the *Double Eagle II* gondola and the personal equipment of the three balloonists survived the enthusiasm of the French welcome in the wheat field where the touchdown took place. The balloon itself was torn into little pieces by souvenir hunters.

The Smithsonian Institution's National Air & Space Museum in Washington, D.C. has requested and will receive the gondola—which will be exhibited in the Museum near Lindbergh's *Spirit of St. Louis.*

RJA ANNOUNCES DETAILS FOR RETAIL JEWELRY STORE MANAGEMENT PROGRAM

Details have been announced for the 39th Program in Retail Jewelry Store Management presented by Retail Jewelers of America (RJA) and New York University Institute of Retail Management.

This former Bulova/NYU Program, which is now sponsored by RJA who plans to offer a cross-country version later on, is scheduled to take place February 14-23, 1979, at NYU in New York City. The nine-day course will comprehensively cover all the important aspects of jewelry store management: financial control, sales promotion management, merchandise management, and store operation.

Those who satisfactorily complete the program will receive a Certificate of Completion.

Instructors will be recognized specialists on the staff of NYU Institute of Retail Management as well as outstanding executives from both jewelry store retailing and closely related fields.

To assure each program participant an optimum learning opportunity, the number of enrollments will be limited. Regular cost of the program if $550; special charge to RJA members: $450. The fee includes tuition, all educational materials, and the closing exercise luncheon. Meals and hotel accommodations are additional.

Further information and applications can be obtained from RJA, 1271 Avenue of the Americas, New York, New York 10020.

COURSES OFFERED BY WOSTEP

The Watchmakers of Switzerland Technical Education Program is now offering two training sessions per year at its center in Neuchatel, Switzerland.

The next course will be given from January 8 to May 25, 1979. Candidates must have a basic knowledge of watch servicing and repair in order to apply.

The course, given in English, focuses on the practical work of repairing modern mechanical and electronic watch products.

New WOSTEP candidates are invited to write for details about the program to The Watchmakers of Switzerland Information Center, Inc., 608 Fifth Avenue, New York, NY 10020.

BULOVA TROPHY

Sonny Werblin (R), president of Madison Square Garden, and Bulova chairman Harry B. Henshel, stand atop United Nations Building in New York with the Bulova Trophy presented to the winner of the Roosevelt International–the $200,000 invitational trotting classic held annually at the Roosevelt Raceway on Long Island. The race, the world's premiere international event in trotting, this year drew entries from

Canada, France, Finland, New Zealand and the United States. The Italian champion Delfo, last year's winner, came down with a fever and was scratched. The 1978 winner was Cold Comfort, of the United States. The press conference before the race is held at the UN, and is hosted by Madison Square Garden, which owns the Roosevelt Raceway. Diplomatic representatives of all nations with entries, including the United States, were present, together with the drivers, owners and grooms and the international sports press.

JEWELERS URGED TO MAKE HOTEL RESERVATIONS EARLY FOR RJA'S FEBRUARY SHOW

Jewelers planning to attend RJA's 1979 Spring International Jewelry Trade Show & Confrerence, February 11-14, are urged to make their hotel reservations early, according to Trade Show Director Mort Abelson.

"RJA has reserved a block of rooms at both the Americana and New York Hilton Hotels," commented Abelson. "But these rooms, which are available at convention rates, are limited in numbers. Jewelers should write now to the hotel of their choice–not to RJA–and reserve their space to avoid disappointment later on."

Jewelers requesting reservations at either of the two hotels should designate that they are planning to attend the RJA Show in order to obtain the convention rates.

SEIKO RESTRUCTURES U.S. OPERATIONS

Mr. Hideaki Moriya, president of Seiko Time Corporation recently announced a restructuring of Seiko's operations in the United States, effective October 1.

The restructuring is as follows. Seiko Time Corporation will remain the marketing, sales and service organization for all Seiko brand products.

A newly-formed organization, SPD Precision, Inc., has been established to market and service all non-Seiko brand products.

Both companies will become subsidiaries of a new holding company, Hattori America Corporation.

Mr. Moriya stated that the restructuring will insure Seiko's continued growth in the U.S. and strengthen its entire sales and service operations.

The officers of the holding company and the two subsidiaries will be announced in the near future.

MARSHALL-SWARTCHILD ACQUIRES ELGIN DOMESTIC AMERICAN MATERIAL LINE

Edward L. Endman has purchased from Elgin Watch Company its Genuine American Movement business. In doing so he has expanded still further his position as head of the oldest and largest watchmakers' and jewelers' supply house in the United States—and most likely the largest in the world: Marshall-Swartchild Company of Chicago, Dallas, San Francisco, and Seattle.

After "growing up" in the material business and devoting many years to it, followed by a shorter period of consultancy for a major watch company, Endman retired. Retirement was brief. In 1968 he acquired C & E Marshall Company. A few years later he acquired the now 110-year-old Swartchild & Company, and in 1973 merged it into the present firm.

In the current expansion, all the inventory of materials, packaging and equipment has been moved from Elgin to Marshall-Swartchild headquarters.

Watchcraft Products has been chosen as the name for the Elgin American Material sales activity of the new Marshall-Swartchild division. It will serve all the United States, Canada, Mexico and other parts of the world where American-made Elgins still are in use.

"It is with great pleasure," says Endman, "that I will be able to meet the needs of my many wholesaler/jobber friends in the industry, as well as watchmakers and jewelers everywhere."

American-made Elgin models covered by the Watchcraft materials inventory include: 552, 533, 535, 539, 541, 543, 546, 547, 554, 555, 556, 557, 558, 559, 571, 573, 574, 575, 607, 616, 617, 617L, 618, 619, 619L, 624, 626, 627, 641, 642, 647, 650, 651, 655, 656, 661, 662, 666, 667, 668, 670, 671, 672, 673, 674, 676, 680, 681, 682, 683, 685, 687, 688, 700, 701, 703, 704, 705, 710, 711, 712, 713, 714, 715, 715, 718, 719, 721, 724, 725, 729, 730, 730A, 730C, 732, 740, 741, 742, 743, 744, 750, 752, 760, 761, 762, 775, 777, 781, 783, 784, 785, 787, W800, W803, 804, 807, 808, 830, 830A, 832, 832A, 833, 833A, 900, 902, 906, 907.

Watchcraft Company's address is 2040 Milwaukee Avenue, Chicago, Illinois 60647, or for mail, P.O. Box 726, Chicago 60690.

HAL WILENSKY JOINS SEIKO TIME CORP AS MANAGER OF DISTRIBUTION RELATIONS

Hal Wilensky has joined Seiko Time Corporation in the newly-created position of manager of distributor relations, it was announced recently by Hideaki Moriya, president.

For the past two years, Mr. Wilensky was sales manager for Eisenstadt, a division of Lenox, Inc., leading jewelry distributor. Earlier, he had held key sales positions during six years at Lenox Candles, another division of Lenox, Inc., which included eastern regional manager, field sales manager and most recently, national sales manager. He is a graduate of the University of Vermont, with a degree in Business Administration.

In his new capacity as liaison between Seiko and its distributors, he will be reporting directly to Mort Gershman, vice president of sales.

Seiko Time Corporation markets it watches through 15 distributors located throughout the U.S.

BASLE: THE WATCH AND JEWELRY CAPITAL

A recent poll reveals that 45% of trade visitors to the European Watch, Clock and Jewellery Fair are retailers, with 76% of them attending for at least the second time.

Of all the watch and jewelry trade shows held every year around the world, none can match the size or attendance figures of the European Watch, Clock and Jewellery Fair in Basle, Switzerland. Every year, tens of thousands of trade visitors flock to Basle.

While a good number of them, representing every part of the world, do register at the door in order to benefit from special arrangements, most visitors choose to remain anonymous. In order to find out more about them, the Fair's authorities polled a representative sample during the sixth annual last spring. A clearer profile of the typical trade visitor is now available.

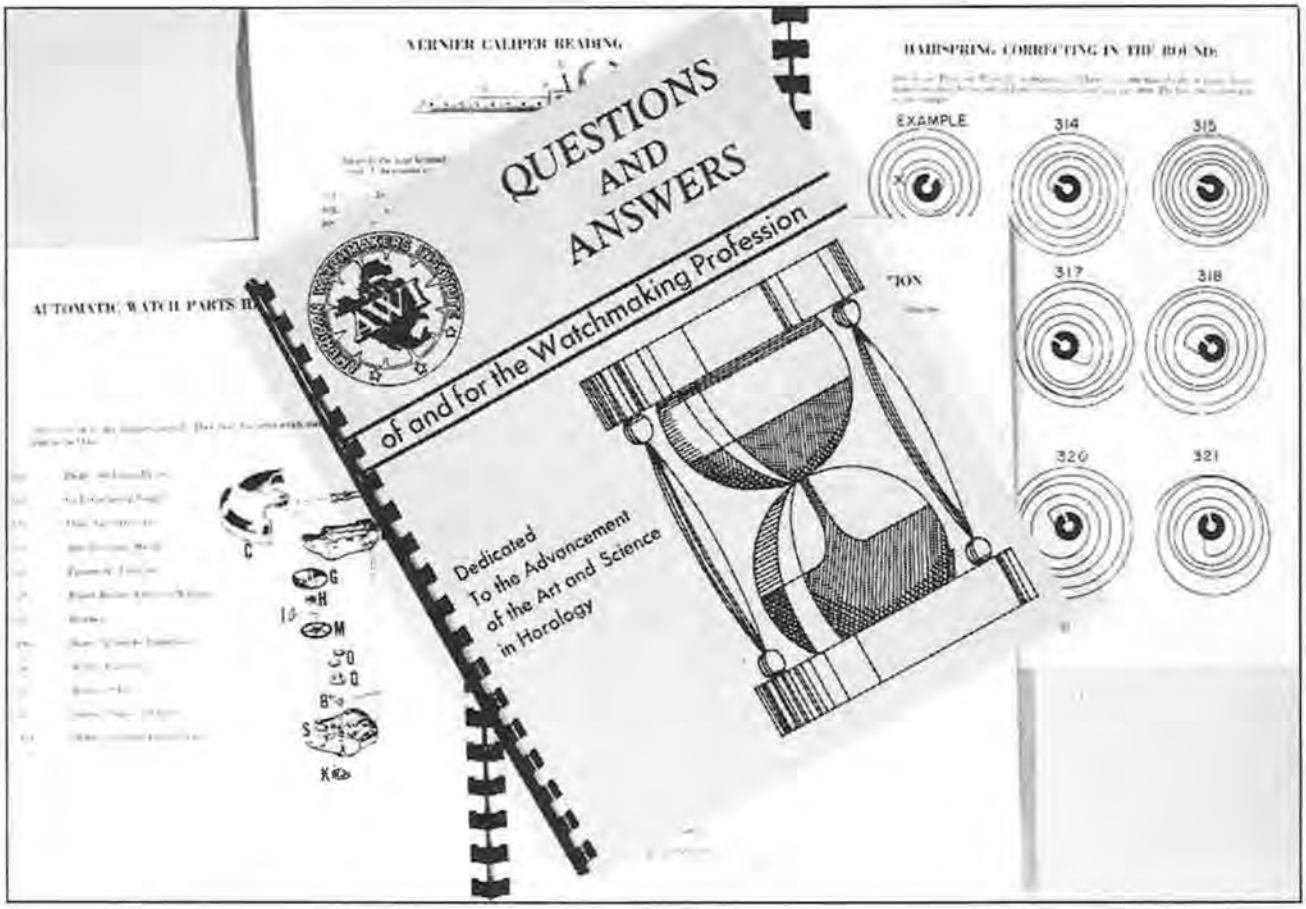
Among other things, the poll led the authorities to revise certain long-held assumptions: while the first Fairs seem to have attracted a majority of distributors, today retail jewelers dominate. The breakdown is as follows: retailers, 45%, wholesale distributors and similar, 30%, manufacturers, 25%.

These figures concur with the opinion of one member of the European Committee of Exhibitors, according to whom "by the tenth annual Fair all European retailers of any importance will have come to Basle at least once." By that time, in fact, they will have visited the Fair more than once, for, as the poll showed, over three-fourths (76%) of visitors had visited the Fair the year before; 44% of them had traveled to Basle 7 times or more (so they had even known the original Swiss Watch and Jewellery Fair); 59% had visited no other watch and jewelry trade fair in the 12 previous months.

Also, 44% of trade visitors travel to Basle at the invitation of exhibitors, and on the average, spend 3½ days there. Over half come on their own. By order of importance, the main reasons they gave for coming to Basle were the full and varied range of product lines on display, the opportunity of inspecting every significant new item, the abundance of technical, styling and business information, and the quality and quantity of business contacts.

This amply demonstrates that the European Watch, Clock and Jewellery Fair is valued not only as a trade fair but as a unique information medium. Early information on the latest styling and technological trends is a must today to avoid ordering obsolescent goods. So in industries as fast-paced as watchmaking and jewelry have become, the European Watch,

Questions and Answers Book Available



The AWI Book "Questions & Answers of and for the Watchmaking Profession" can help you with the answers to questions you have always been meaning to read-up on sometime. Featured in the book is nomenclature, parts identification along with questions and answers of items which frequently appear on certification or state licensing examinations. The material presented in this book has been prepared and approved by leading horological educators in the country; namely members of the AWI Research & Education Council. Order your copy from AWI Central, P.O. Box 11011, Cincinnati, Ohio 45211. Please enclose your check for $4.95 with your order. We cannot accept COD or open account orders.

Clock, and Jewellery Fair provides visitors with an invaluable opportunity of getting their bearings and planning their next moves.

While the number of importance of exhibitors at the European Watch, Clock and Jewellery Fair have earned Basle the title of European watch and jewellery capital, its influence is really worldwide. At least 10% of the visitors to the Fair come from overseas; they number in the thousands, often travel in groups, and come from Japan, the USA, Hong Kong and a variety of other countries.

Yet precisely because of the Fair's drawing power, a number of trade visitors experienced some difficulty in finding accommodations as they had not booked their rooms early enough. Such is the price of success. But a series of major efforts are going to be made in 1979 to overcome these difficulties. To be on the safe side, start preparing your visit now. Just send a postcard to European Watch, Clock and Jewellery Fair, P.O. Box, 4021 Basle, Switzerland, for full information on the seventh European Watch, Clock and Jewellery Fair, Basle, April 21 to May 1, 1979.

RJA ANNOUNCES SECOND ANNUAL SCHOLARSHIP PROGRAM

RJA's Second Annual Scholarship Program for the Gemological Institute of America's Diamond Correspondence Course has been announced by RJA Board Chairman Michael D. Roman. Continuing the format initiated in the Program's 1978 debut, RJA will again offer 165 Scholarship Awards valued at $40,000.

"The reaction to our Program launched last year was overwhelming," commented Roman. "It proved we are filling a widespread need by retailers for an ongoing specialized educational program. RJA's goal is to help its members develop professionalism, pride and profits in diamond selling through education."

Scholarship distributions will be tied to membership totals within each of RJA's state associations. All requests for applications must be sent from each store to RJA, 1271 Avenue of the Americas, New York, New York 10020. Deadline for completed applications is May1, 1979.

AFFILIATE CHAPTER COLUMN

(Continued from page 33)

a sell-out success with 33 watchmakers attending.

Everyone enrolled had an opportunity to tear down and reassemble the Seiko quartz 0903A gents and the 4300 ladies. AWI instructor Les Smith simplified the learning process by showing the step-by-step procedures in a series of slides.

At the November meeting of NJWA, Paul Wurthrich, manager of product design for Timex Corp., will be talking to the club about the Timex quartz. Wurthrich will explain quartz crystal oscillators, their function, attributes, and limitations, and how these principals are adapted to drive quartz analog and quartz digital watches. He will also cover the quartz digital liquid crystal display, its structure and function, and explain the quartz analog and how it differs from other motor systems. Finally, Wurthrich will deal with quartz clocks and their various motor drive systems past and present.

Southern Arizona Horological Guild officers and guests. L-R: Gwen Knadel - Vice President, Orville R. Hagans - AWI President, Frank Lang - President, Mrs. Hagans, Palma Padula, Secretary, and Art Noclet - Treasurer.

ARIZONA

The Southern Arizona Horological Guild had the honor of having AWI President Orville R. Hagans as their guest speaker at their September 6 meeting. Mr. and Mrs. Hagans enjoyed the buffet dinner before the meeting. After a brief meeting, Mr. Hagans addressed the guild. His many years at the bench and writing for magazines, plus experience with AWI and associates, made his talk informative, interesting, and memorable.

ONTARIO

The Ontario Watchmakers Association held a dinner meeting on October 23 in Toronto. After a general meeting, Mr. Gerard Progin with the assistance of Mr. W. Von Bueren presented a technical program on "the Portescap story."

On November 5, OWA and AWI will present a bench course on "Repair of the Bulova Accutron Quartz SMQ Calibre 242." The program will take place at The George Brown College of Applied Arts and Technology in Toronto. Instructor will be Mr. Howard Opp.

NEW PRODUCTS

UNIQUE JACOBY-BENDER GOLD CATALOG CREATES GREAT CONSUMER INTEREST

To herald its entre' into the gold jewelry manufacturing business, Jacoby-Bender, Inc. has produced and is now making available a most unusual full color catalog and display brochure.

The unusual format permits the front cover to open in the center, half the cover to the left, half to the right. Succeeding half pages show different necklaces, bracelets and clothes on the full page view of the model, with each turn of the page.

The new merchandising concept, originated by Jerry Hahn, V.P. Advertising for Jacoby-Bender, allows the jeweler to use the catalog as a point of sale display.

"We printed a special edition that deleted all the cost information that appeared in the original edition," said

Mr. Hahn. "In addition we produced a lucite holder for counter use," continued Mr. Hahn, " so that the brochure without the jeweler's cost figures could be viewed by his customers as a style selector from which they could choose any of the merchandise shown, or special order to size."

Mr. Hahn mentioned that the special "selling" edition with lucite stand for countertop use is distributed to those retailers whose initial gold jewelry order amounts to $1,000 or more.

The regular 8-page full color brochure illustrating men's and women's necklaces and bracelets is captioned, "The Gold Collection from J-B" and is available free of charge by writing to Advertising Department, Jacoby-Bender, Inc., 62-10 Northern Blvd., Woodside, New York 11377.

SWEST INTRODUCES POLISHING COMPOUND KIT

Swest, Inc. announces a new kit containing 6 of the compounds needed for most buffing and polishing operations performed by the jeweler. One tripoli and five rouges allow the jeweler to progress from coarse buffing to highest polish on precious or base metals. Refills are available for all bars in kit.

For a free brochure on the kit and other polishing accessories along with a price list, contact Swest, Inc., 10803 Composite Drive, Dallas, Texas 75220, 431 Isom Road, San Antonio, Texas 78216, or 1725 Victory Boulevard, Glendale, California 91201.

OKI SEMICONDUCTOR INTRODUCES MULTI-FUNCTION LCD WATCH CIRCUIT WITH NORMAL, STOPWATCH, ALARM AND ALTERNATE TIME ZONE MODES

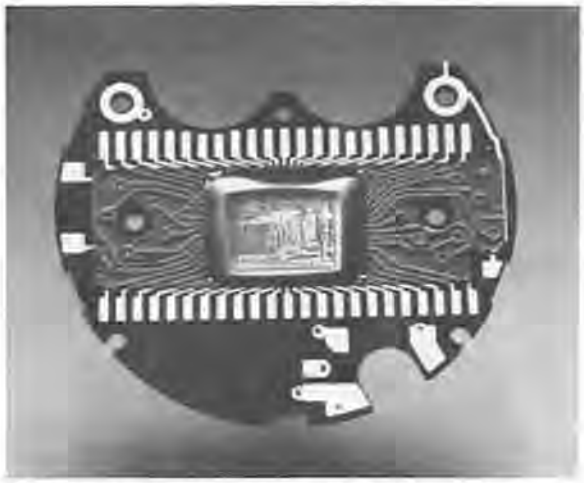
A multi-function LCD watch circuit that can operate as a normal watch, stopwatch, alarm watch and alternate time zone watch has been introduced by OKI Semiconductor.

Designated MSM5516, OKI's new circuit is a low-threshold voltage, ion-implanted, metal-gate CMOS device that provides all signals needed to drive an LCD watch of six digits, ten flags and two information segments. The MSM5516 is designed for use in high-end watch retailing for $50 and up.

When ordered in volume, the MSM5516 is priced at less than $4. The circuit comes in dice form suitable for hybrid assembly or in an 80-pin ceramic flat-pack for testing and evaluation. Delivery is in four to six weeks after receipt of order.

One of a family of seven new CMOS watch chips from OKI, the MSM5516 features low power dissipation (less than 4 microamperes power supply current).

A 32,768 Hz crystal-controlled oscillator provides hours, minutes, day of the week, date or seconds for two different time zones in the normal watch mode.



OKI Semiconductor's new multifunction LCD watch circuit operates as a normal watch, stopwatch, alarm watch and alternate time zone watch. Called MSM-5516, the CMOS chip sells for less than $4. It's available in dice form or in an 80-pin ceramic flat-pack for testing purposes. Delivery is four to six weeks ARO.

In the stopwatch mode, the 32-kHz oscillator is counted down to provide separate hours, minutes, seconds on six digits and tenths of a second on ten flags. And, in the alarm mode, hours and minutes are displayed in four digits along with characters "AL" on two digits.

The MSM5516 circuit features a time display that can be bonded to either a 120-hour or 24-hour format; low-power dissipation (less than 4 microamperes current); direct continuous LCD drive capability via 51 phase controlled outputs; an on-chip voltage doubler to generate the display drive voltage; and three test inputs to speed testing procedures.

Other MSM5516 specifications include colon display; one-touch activated 30-second error correction; four-year calendar; complex one-minute alarm tone; three-button sequential operation; and pinout interfaces with standard six-digit display.

Chip size of the MSM5516 is 153 by 204 mils (or 3.9 by 5.2 millimeters).

Of the seven circuits in OKI's new CMOS/LCD watch chip family, five are currently available and two are scheduled for production quantities in the fourth quarter, 1978. Those available now include a 3½-digit, four-function; a four-digit, six function; six-digit LCD chronograph; a super chronograph; and the six-digit multi-function (MSM5516). Ready by the fourth quarter will be two additional six-digit CMOS devices for LCD watches, one five-function and one six-function.

OKI Semiconductor, based in Santa Clara, California, is a division of OKI Electric Overseas Corp., New York. The newly formed division, American-managed and staffed, has a charter to design, manufacture and market integrated circuits, modules and subsystems in the U.S. and is backed by the worldwide resources of OKI Electric Industry Co., Ltd. of Japan, which through its 28 affiliated companies, sold more than $1 billion of computer and telecommunications equipment last year.

For more information contact Jerry Crowley or Jim Brennan at OKI Semiconductor, 1333 Lawrence Expressway, Santa Clara, California 95051, (408) 984-4840.

VIOLA TWEEZERS NOW AVAILABLE IN U.S.

Viola of Italy, a manufacturer of precision tweezers for the horological trade for over 20 years, is now making its complete line of tweezers available in the U.S. A free catalog is available for the asking. A stock of all standard types is available from the exclusive U.S. and Canadian distributor, Ammark Division of Intrade, Inc., Box 608, Litchfield, CT 06759.

FOUR NEW DAY/DATE QUARTZ DIVER'S MODELS INTRODUCED BY SEIKO

Seiko Time Corporation recently announced introduction of four new day/date quartz diver's models, including a professional diver's model with a water-resistant case tested down to 2,000 feet.

Each of the new quartz timepieces features an instant day/date calendar, external rotating bezel, Hardlex mar-resist crystal, screw-type locking crown and black pressure vented strap.

Water-tested to 150 meters or 500 feet is model 60595. It has a stainless steel case with bold orange dial, and is priced at $250. A second 150 meter watch, also with stainless steel case and navy blue dial with red and blue bezel, is model 60597, also priced at $250.

For the more sophisticated diver, there's model 60585. Water-tested to 300 meters or 1,000 feet, this watch is designed to be used for saturation diving using helium gas. The new stainless steel timepiece, with black dial, retails at $350.

The ultimate boundary of technology—a professional quartz diver's watch, model 60583, is water-tested to 600 meters, a full 2,000 feet, with a one-piece titanium case, also designed for saturation diving. This new timepiece will retail for $595.

SEIKO INTRODUCES 22 MECHANICAL WATCHES

Seiko Time Corporation recently introduced 22 mechanical watches for the Fall, featuring decorative dial colors and fashionized case designs. The new introductions include 5

ZWA21M

CW241M

new men's self-winding day/date models and 17 models for ladies.

The five new men's models, in the "Automatic Series" include masculine-looking models CW241M and CM242M. In stainless steel, at $85, model CW241M features a black dial. Its mate, model CW242M, in yellow top, has a two-tone bracelet and gilt dial, at $125. Both also feature adjustable bracelets.

Highlighting new yellow top model CW238M is a faceted crystal on a white dial. It also features a lovely linked adjustable bracelet, at $145.

Classic lines complete this series—model CW239M, at $79.50, in stainless steel, with blue dial and CW040M, at $125, in yellow top, with gilt dial. Both models have adjustable matching bracelets.

Among the 17 new ladies mechanical timepieces introduced are 16 stunning "Designer Series" models. Highlights in this collection include models ZWA21M and ZWA-22M. Both these timepieces feature horizontally decorated dials matching the lines on the watch case and bracelet. Model ZWA21M, in white top/stainless steel, with silvertone dial, at $100, is equally appealing as its counterpart, model ZWA22M, in yellow top, with gilt dial, at $110. Both models also have adjustable bracelets.

A deep red dial, framed in a yellow top case, with carvings at the 3 and 9 o'clock positions on the case, is found in new model ZWA68M. At $145, this elegant timepiece also offers an adjustable bracelet.

Whether choice be stainless or yellow—a delicate chain bracelet with an octagonal shaped dial enhances new model ZWA70M—in yellow top, with gilt dial at $135 . . . and ZWA69M in stainless steel, with white dial at $120. Like all the other "Designer Series" watches, they feature adjustable bracelets.

The new addition to the "Lady Seiko Self-Winding Series" is sporty model ZP301M, a stainless steel model with a 24-hour full numeral white dial, sweeep second hand, and date calendar, in a water resistant case. It retails at $105.

All the new Seiko timepieces are available for immediate delivery through Seiko's nationwide network of distributors.

AWI Bench Courses 1978-79

LEGEND		
Symbol	Course	Usual Instructor
A	Reading Meters	J. Jaeger
C	Citizen	J. Broughton
D	Seiko	L. Smith
E	Intro. Solid State	R. Nelson
F	Bulova SMQ	H. Opp
G	ESA	W. Biederman

DATE	COURSE	LOCATION
November 5, 1978	F	Toronto, Canada
November 5, 1978	C	Elizabethtwn, KY
November 12, 1978	F	Montgomery, AL
November 12, 1978	E	Boston, MA
November 12, 1978	G	St. Louis, MO
November 13, 1978	F	Jackson, MS
November 26, 1978	F	Memphis, TN
January 14, 1979	G	New Jersey
January 14, 1979	D	Ft Lauderdle, FL
January 14, 1979	C	Abilene, TX
January 14, 1979	F	Tallahassee, FL
January 21, 1979	E	Los Angeles, CA
January 21, 1979	G	New Orleans, LA
January 28, 1979	F	Dallas, TX
February 4, 1979	D	Phoenix, AZ
February11, 1979	F	Jacksonville, FL
February 11, 1979	G	Tucson, AZ
February 12, 1979	G	Albuquerque, NM
February 18, 1979	D	Birmingham, AL
February 18, 1979	C	Sacramento, CA
February 18, 1979	F	Hot Springs, AR
February 25, 1979	E	San Antonio, TX
February 25, 1979	G	Chicago, IL
March 4, 1979	F	Atlanta, GA
March 4, 1979	D	Norfolk, VA
March 11, 1979	E	Richmond, VA
March 11, 1979	C	Decatur, AL
March 11, 1979	G	Washington, DC
March 18, 1979	F	Cambridge, OH
March 18, 1979	D	Indianapolis, IN
April 1, 1979	F	Pittsburgh, PA
April 1, 1979	E	Omaha, NE
April 1, 1979	C	Orangeburg, SC
April 1, 1979	D	Dallas, TX
April 22, 1979	D	Baltimore, MD
April 22, 1979	C	Minneapolis, MN
April 22, 1979	G	Iowa
April 29, 1979	F	Cleveland, OH
April 29, 1979	E	Quincy, IL
May 6, 1979	E	Perryburg, OH
May 6, 1979	D	Portland, OR
May 6, 1979	F	St. Louis, OR
May 6, 1979	C	Boston, MA
May 6, 1979	G	Denver, CO
May 20, 1979	D	Okmulgee, OK
May 20, 1979	F	Kansas City , KS

Additional programs will be scheduled as requests are received and new programs are developed.

ODD *but* TRUE©

by Orville R. Hagans, CMW, CMC

Reprinted from the book, Odd, But True, *compiled by Orville R. Hagans.*

Book Review

by Henry B. Fried

Mercer Chronometers: Radical Tom Mercer and the House He Founded, by Tony Mercer. Long Island City, New York, Brant Wright Associates, Ltd., 1978. 251 pages, 82 figures, 24 color plates. $95.00

It is good that this story has been chronicled, as we are now in the twilight age of the mechanical marine chronometer, the most precise and elegant self-contained mechanical device ever made. The Mercers are the only surviving producers of these beautiful instruments. Tony Mercer, FBHI, grandson of the founder, is the last of an illustrious family of chronometrists, going back 120 years to the founding of the family-name business. The history of the marine chronometer has been ably documented by Gould and by others. However, this book is not only about the marine chronometer, but mainly concerns those who made them.

The history of Thomas Mercer and his family is told by the author in an unusual, frank and earthy style which sheds light on the horological personalities of the times, living and working conditions of the workers themselves, their skills, methods, behavior, their tools, training, and the life, age and eras in which they lived.

At that time, specialization, even with hand skills, was fragmented into subspecialization . . . "these specialists included chain polishers, chain riveters, wire cutters, link cutters, chain examiners and chain finishers" just to name a few of the small segment of a category of specialists who made chronometers.

Names and interesting bits about super-skilled specialists of whom we would never otherwise hear are recounted in this book. Mainly, the story of personalities is about Thomas and his son, Frank Mercer. However, there is a great deal about chronometers as well, with detailed lists, dates, and customers (who put their own names upon them).

Thomas Mercer, a Lancastrian, was born in 1822. His son Frank inherited the firm with his brother Tom in 1900. Those in this country who met Frank Mercer in his visits here will remember him as a dynamic and friendly, typically English businessman. His quick facility with the insides of a marine chronometer was a pleasure to watch.

Tony Mercer plots the family tree and history of each member. The author also gives interesting highlights of the details of workmen, watchmakers, their habits (mostly drinking) and incredible skills with overlong working hours and very low pay.

It is told here that despite the growth of mechanical factories, "the watch and clock trade continued to rely on hard work and to shun the use of modern machinery–lathes and other engines were turned by treadle, throw wheel or bow." A footnote reminds us that Mercer chronometer craftsmen finishers still use the bow and turns for final surface finish.

The author recounts also how the American machines were the envy of England, while the English craftsman with his specialized but perfected skills produced objects of great perfection under atrocious working surroundings.

Mercer also writes about famous chronometer makers, such as Frodsham, French, Dent, Molyneux, Fletcher, and many others whose names are famous in chronometry. He also tells about Lancashire tool makers and their manufacturing methods in a most interesting, easy-to-read manner. The making of files by hand, like other facets of the tool suppliers' trade, is told in some detail.

In other chapters, Tony Mercer tells about the experimentation for the perfection of isochronism, elimination of the middle temperature errors, the unusual "affixes" used by the different makers and the testing. Here one wonders while reading this how these instruments with their time-consuming adjustments could fetch only a small price for a two-day chronometer in the first third of this century. Mercer also tells about a relative, George Thompson, a chronometer box-maker who supplied a finished product in solid, teak, ebony, mahogany, or rosewood with inlaid brass and ivory and mother-of-pearl inlays sold for just over a pound sterling. Facts such as these abound throughout the volume, together with incidental accounts of how some parts were made, adjusted, and tested.

The book contains twelve formal chapters and six appendices. Some chapter headings are *Clerkenwell 1854, The Old Home, The Workshop, Prescott–1900 Onwards, Greenwich and Other Trials, The Trawler Experiment, Biographies and So On.* The appendices are titled, *Technical Exploded Drawings, Electrical Clock Installations, Chronometer Serial Numbers, Chronometer Clocks, Index of All Known Mercer Chronometers.*

The illustrations, some in larger-than-life full color photographs of chronometer movements, balances, pocket chronometer watches, are excellent. The page-sized exploded drawings of various types of chronometers are the best ever seen of these movements ever seen by this reviewer, although some of the ultra-thin lines on some drawings appear very weak due probably to reduction from the very large original art. The whole, however, is remarkably clear and should be an instructive reference for those who repair and collect chronometers.

□

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HOROLOGICAL TIMES; P. O. Box 11011; Cincinnati, Ohio 45211; (513) 661-3838

THE TRADESMAN

Clock repair material and tools. Manufacture of clock springs, dials, escape wheels, verge kits, weights, all types of brass and steel stock and custom made parts. Catalog postpaid $1.00. Tani Engineering, Box 338, Atwater, Ohio 44201.

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

Owner deceased. Jewelry store with very good watch and jewelry repair department. Downtown southwest Florida. Send correspondence to Watchmaker, 1634 Grace Avenue, Ft. Myers, Florida 33901.

Reprint, Kendrick & Davis Co.'s, 1910 catalog section of "Staking Tools & How to Use Them," 100 pages with detailed line drawings, $3.50 copy, postpaid. R & S Company, Box 31, Lebanon, N.H. 03766.

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