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The recommendation was made at AWI's Board Meeting last June 28th to require all watchmaking students to wait 2 or 3 years after graduation before being able to take the Certified Master Examination—the recommendation was voted down.

Why? Well, first you must realize why the American Watchmakers Institute exists—it's because of a lot of individual watchmakers who felt that if they all banded together and formed a strong and understanding national organization, it would benefit the present, and preserve the future—"Horologists Helping Horologists."

Now, if a watchmaking student had to wait two years before he could take the CMW examination, there would be a lot fewer people taking the examination, because of problems like inflation, starting a family, finding the time, making the effort, and securing a monitor to conduct the examination. Also, realize that this person will start losing dexterity on the lathe during those two years because it is not used much in the trade today and that person will also begin to lose technical knowledge on things like the escapement and formulas.

How would you like to go through high school and be told that you would have to "wait" another two years before you could take your final exams? If you could find the time, the monitor, remember everything that you studied in high school, and pass your final exam—you could then receive your diploma.

The AWI Board did the right thing by keeping the CMW examination available to anyone who feels he has the skills and knowledge to pass it.

Let me give you an analogy that will help explain the "long-term" picture.

If the CMW examination were made more difficult or if a person had to wait two years before being able to take this exam, there would be noticeably fewer people taking the CMW exam—it would be like putting your hands around your own neck and squeezing, because you like the blood you already have. If the examination were made more difficult, it would be like squeezing tighter, if a person had to wait two years, it would be like squeezing even tighter—do you know what happens if you don't have "circulation?" Right. You will get paler and paler and, somewhere down the road, you will die.

Now, keep in mind that the average age of the watchmaker in the United States is in the 50's and then look down the road 10 or 15 years, when today's leaders are gone or retiring—you will see why we must encourage "circulation," not restrict it further!

Do you remember the era when the New York Yankees dominated baseball? The reason for this was because the Yankees had such a good farm system or "rookie club." The Yankees had a bigger farm and they had more rookies circulating through it. Therefore, the percentages yielded more outstanding players that came up to the Major Leagues and won the crucial games for the Yankees. Now, realize the similarities between the rookie farms for the Yankees and the watchmaking schools for the American Watchmakers Institute. The future of our profession belongs to the young people entering the profession today!

As a watchmaking instructor for the past 16 years, I have seen the desire and motivation develop when students started my classes, because they knew if they really put forth the effort, they would have the opportunity to become a Certified Master Watchmaker when they graduated. These are not only better qualified leaders for tomorrow, but they are much more likely to remain in the watchmaking profession when "Certified." These are the people who need the prestige of CMW—most!

Now, you realize why it's so important to change the by-laws and give the Chairman

of the Research and Education Council full voting rights. I felt a little ashamed, sitting there at the Board Meeting last June when the by-laws were read, saying that the newly elected Chairman of the Research and Education Council was deemed an official Board Member, but without voting rights. This is an error that has gone unnoticed for too long. The necessary steps to change the by-laws should be started at once, so that at next June's meeting, we can give "full voting rights" to the REC Chairman. This person represents the "leaders" (teachers) of all the "rookie farms" (watchmaking schools) from all across the United States, and thus represents the long-term future of our watchmaking profession.

I've been asked the question, "Where does the present Certified Watchmaker examination fit the picture?" Well, I've thought about its relevance to the survival of our profession when the average age of the watchmaker approaches the retirement age, say 10 or 15 years from now. We need to plan ahead and make every effort to increase the "circulation," not decrease the "circulation" like making the CMW exam tougher or to make the future blood wait for 2 years before they can circulate with honors.

My conclusions about the future of the Certified Watchmaker examination are: that the entire examination should be set on the shelf, and that the present Certified Master Watchmaker examination should be split into two sections. One section would include the "Written" portion and the "Watch Repairing" portions, and the other section would contain the "Lathe" portion. When a watchmaker passes these first two portions, he or she would become a Certified Watchmaker. If a watchmaker wanted to become a Certified Master Watchmaker, he or she would have to pass the "Written" portion, the "Watch Repairing" portion, and the additional "Lathe" portion.

This will increase the number of examinations (the "circulation") by recognizing that there are 42 States, out here, that don't have any license requirements and that the great majority of the watchmakers in these states do not use a watchmaker's lathe.

As it stands now, the AWI is denying the majority of these watchmakers the opportunity of becoming anything except a member in good standing. It would be inaccurate and unfair to say that the people who repair watches without using a lathe are not good watchmakers—they have a track record and a reputation of excellence, but because they don't have lathe skills, they are automatically eliminated from ever becoming "Certified."

I think the additional requirement of the "Lathe" portion of the CMW exam is a just tribute to the lathe. The lathe has a special warm spot in the olders watchmaker's heart, because without your "partner," the lathe, I don't think the watchmaker would have survived the early days. I think it is a fitting tribute that the new blood coming into the profession should have to pass the additional "Lathe" portion in order to be called a Certified MASTER Watchmaker.

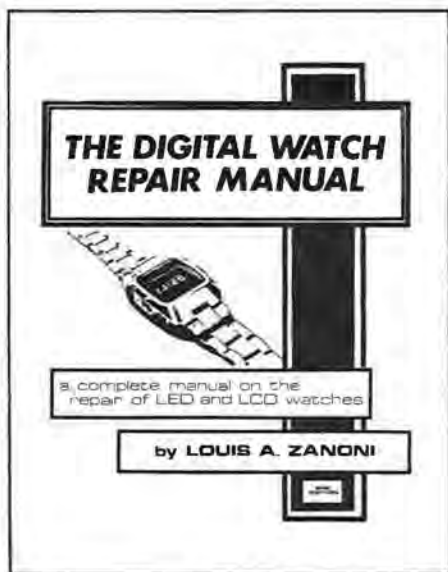
This new approach to certification would also allow a CW to come back at some later date and upgrade his or her certificate to Master. It would also tend to keep that person in the profession for the long run, and he or she would be a more dedicated, dues-paying member of the American Watchmakers Institute.

Let us keep the American Watchmakers Institute a "Horologists Helping Horologists" organization—to benefit the present and to preserve the future.

Howard Woodward
Member REC — AWI
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THE AGONY AND THE ECONOMY

This is not a political speech, but only my thinking on some of the free world's economic problems. (Once in a while, I can't help but get on the old soap box.)

For the past seven years, at every economic summit, the U.S.A. has been blamed by the other six leading Western nations for the economic problems of the free world. Although it is beyond our control, it seems that we are again being blamed this year for the sluggish global economy—despite all evidence to the contrary.

This year, most of the clamor occurred over the high interest rates in the U.S. Can this be so bad for us since the value of the dollar is now at its highest point in seven years? And *when the value of the dollar goes up, the price of gold goes down!*

High interest rates in the U.S. seem to be less a factor in the problem



Joe Crooks

than two other elements: 1) a belated "baby boom" in Western Europe; 2) the continuing impact of increases in crude oil prices.

The "baby boom" began in the U.S. immediately after World War II. In Western Europe, however, it didn't start until a decade later because these

nations were practically destroyed during the conflict. Now in their early twenties, these "late" post-war children are looking for jobs.

As a result, Europeans are beginning to experience the high unemployment that plagued the U.S. economy throughout the 1970's. (We are now at virtually a break-even point in terms of population growth.) Today, in Belgium, one third of all 25-year-olds have never held a full-time job. In Great Britain, more than two million persons were out of work the first of this year. In West Germany, the level was over a million and a quarter, and the other Western nations are in the same boat. Are we to blame for this? I can't be. I came back from overseas in 1946!

The role of oil prices in the total economic picture needs no explanation. Following the 1973 "oil shock,"

(Continued on page 53)

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The Writings of W. H. Samelius

Watch & Clock Information Please! by William H. Samelius, Dean of American Watchmakers. Edited by O. R. and Josephine Hagans. 408 pages, 9 in. x 6 in., over 260 illustrations, hard cover and dust jacket. Published by the American Watchmakers Institute, 1981, at \$30.00.

William H. Samelius (1872-1961) was Dean of the Elgin Watchmakers College for over thirty years and was considered then to be the Dean of American Watchmakers. He also conducted the department, "Information Please" of the trade journal *The American Horologist*. During that time, he answered inquiries in detail, accompanying many with his own fine, professional drawings. The gamut of answered inquiries included many on clocks, watches, history, odd escapements, common escapements, formulas, gear cutting, ratios, tables of all types, jewelry repair questions, tools and equipment, "trouble-shooting," and much more.

Now, the best of thirty years' worth of answers have been published in one book. Any repetitions have been edited by Orville R. Hagans, formerly editor of the publication in which the answers first appeared, and by Jo (Mrs.) Hagans. The result is an excellent, almost encyclopedic addition to the horologist's library, containing information otherwise lost in the dusty piles of old trade journals.

Mr. Hagans, who likewise compiled the writings of Jesse Coleman, did a most commendable job of collecting and grouping Samelius's replies into easily found categories. Mr. Hagans also supplied a most detailed cross index. There are over twenty-two main categories of information. These include: escapements; hairsprings; mainsprings; watch and clock and chronometer dismantling and assembly; striking and chiming clocks; pendulums; wheels; technical data; dials; tools; restoration and repair of clocks and watches; watch and clock adjusting; timing; history; and American horology.

There are well-illustrated, detailed instructions on the lever, duplex, cylinder, detent or chronometer escapements, the tourbillon, pin wheel, verge, McDowall one pin (wheel) escapement, squirrel-cage, Brocot escapement, and other unusual escapements.

There is a special photo section of twenty-six escapement models which Samelius made for the Chicago Science Museum.

In the section on hairsprings, a wide range of sub-topics is covered, from how to make or coil a hairspring to untangling, correcting, removing rust, manipulating and ad-


justing to isochronism. The same coverage includes mainsprings, stop works, automatic watches, proper mainspring lengths of watches and clocks, and repairs to mainsprings. Chronograph repairs are professionally illustrated and detailed in instructional style.

Clock repairs, odd clocks, and odder escapements are covered, as are musical clocks and chiming devices. Pendulums are explained in simple language and with mathematics understandable by anyone with a high school education. Dials and going trains of clocks and watches are included, too.

The section on "technical data" covers electrical current, formulas for jewelry and clockwork, wheel cutting, making a sun dial, and repairing and refinishing clock and watch dials. Also, the uses and maintenance of watch and clockmakers' tools, equipment, and lathes appear in this text.

Making and repairing the verge staff is shown. Escape wheel repairs are equally well illustrated. A section on watch and clockmakers' tables includes a detailed "Relations of Wheels and Pinions" of twelve pages. There also are tables of pendulum lengths, and silent escapements and mystery clocks are revealed. Detailed drawings on the making of a seconds beat regulator is a textbook in itself.

Short histories of many American clock and watch companies are included, as are histories of the better-known English and European makers. An index of American Horology requires a number of pages. The detailed index itself requires twenty pages to cover the broad spectrum of the book's contents.

Samelius's compass of horology covered a very large radius. While Coleman, whose writings were also compiled and edited by Hagans, was essentially clock-oriented, Samelius had a very thorough background in horology. His father was decorated by the King of Sweden for his horological efforts, and William H. learned much from his illustrious father. Samelius's access to the largest of American watch factories also enriched his expertise. His large library and his ability to travel throughout the country lecturing gave him much insight into the needs of the American watch and clockmaker. Samelius's knowledge of horology included both the practical and the theoretical. Also, his skill as a bench worker was well known, and the thousands of watchmakers whom he trained richly earned him the title of Dean of American Watchmakers which he held for many, many years. This book is his monument, thanks to O. R. Hagans, and a benefit truly to all who will read and own a copy. 

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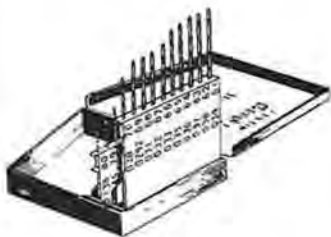
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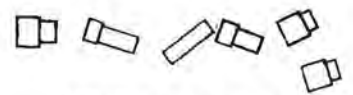
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Our Readers Write

PRAISE FOR AWI...

I appreciate your technical service very much and all the other facets of our organization—the bench courses, the technical tips, and all the informative articles in the *Horological Times*.

Thank you for the many wonderful services.

Emerick Nikolschuetz
 Viroqua, Wisconsin

... AND FOR MR. BURCKHARDT

Thanks for a terrific magazine, *Horological Times*. I especially liked the article "How Much Are You Worth?" by Fred Burckhardt in the July issue.

Thayne L. Baldwin
 Seattle, Washington

On the Front

The intriguing close-up shot on our September cover comes to us from the Hoh Rain Forest in Olympic National Park, Washington State. Though rain forests are technically features of tropical regions, the heavy rainfall, dense vegetation, and rare animal life of this area prompted the formation of Olympic National Park in 1938 for the purpose of preserving the "rain forests" of the Pacific Northwest.

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Technically WATCHES

By Archie B. Perkins, CMW, FNAWCC
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The Modern Watchmakers Lathe © 1981

Part II

Since the invention of the Moseley hollow spindle lathe, many other lathes of significance have been designed and manufactured, both in America and in Europe. Some of the more important brands of lathes are listed alphabetically as follows:

- Bergeon (Swiss)
- Boley (German)
- Clement (Waltham, Mass., U.S.A.)
- Derbyshire (Waltham, Mass., U.S.A.)
- Favorite (Swiss)
- Geneva Style Lathe (Swiss, German)
- Hardinge (Chicago and New York, U.S.A.)
- Hopkins (U.S.A.)
- IME (Ideal Machine Tool & Engineering, England)
- Levin (California, U.S.A.)
- Lorch (German)
- Moseley (Elgin & Chicago, Ill., U.S.A.)
- Paulson (Chicago, U.S.A.)
- Rivett (U.S.A.)
- Stark (Waltham, Mass., U.S.A.)
- Webster-Whitcomb (Waltham, Mass., U.S.A.)
- Wolf-Jahn (Germany)

The following is a list of the specifications for some of the most popular lathes and their chucks.

BERGEON STANDARD WATCHMAKERS LATHE

Chuck: W. W. 8mm. Maximum hole through chuck: 5mm

Bed: Small round with flat side, 10 3/4 inches and 12 3/4 inches long.
Headstock: Hard steel cone bearing
Tailstock: Plain
Swing: 3.544 inches or 90mm
Height of centers: 1.772 inches or 45mm
Pedestals: One for 10 3/4 inch bed and 2 pedestals for 12 3/4 inch bed
Finish: Glare-proof enamel
"T" Rest: Tip-over type or solid type
Attachments: All types, slide rest, milling, gear cutting, grinding, etc.
References: See your watch material distributors' catalogs — Jadow and Hammel-Riglander.

BOLEY STANDARD WATCHMAKERS LATHE

Chuck: W. W. 8mm or Mosely 8mm. Maximum hole through chuck: 5mm
Bed: Regular W. W. style, 11 inches long
Headstock: Hard steel cone bearing
Tailstock: Regular or chuck holding lever operated
Swing: 3.940 inches
Height of centers: 1.970 inches
Distance between centers: 4.33 inches
Pedestals: One
Finish: Nickel
"T" Rest: Tip-over type
Attachments: Many attachments available
References: See your watch material distributors' catalogs — Jadow and Hammel-Riglander.

BOLEY INSTRUMENT LATHE

Chuck: W. W. 8mm. Maximum hole through chuck: 5mm
Bed: 400mm or 15 3/4 inches
Headstock: Plain or automatic lever operated chuck closer
Tailstock: Plain or lever operated chuck holding
Swing: 4 inches or 100mm
Height of centers: 2 inches or 50mm
Distance between centers: 9.050 inches
Pedestals: Two
Finish: Nickel
"T" Rest: Tip-over type
Attachments: All standard attachments fit
References: Watch tool catalogs — Jadow and Hammel-Riglander

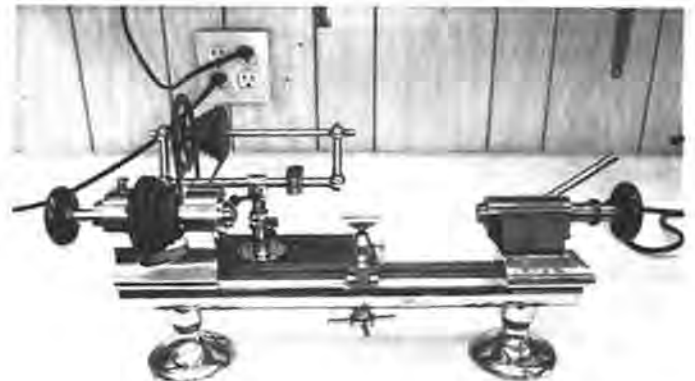
CLEMENT *Watchmakers lathe with or without motor in base*

Chuck: Both Mosely 8mm and W. W. 8mm. Maximum hole through chuck: 5mm
Bed: Both Mosely and Webster-Whitcomb styles. Bed swivels around headstock and base to any angle.
Headstock: Heavy duty
Tailstock: Special swing type (micrometer adjusted) with all types of attachments to be used in the tailstock for rounding up wheels, setting jewels,

Figure 1



Figure 2



boring, turning, polishing pivots, polishing pinion leaves, milling and profiling, filing, etc. Has a turret that fits into the tailstock spindle.
Swing: 3 3/4 inches
Height of centers: 1 7/8 inches
Distance between centers: Approximately 4 3/4 inches with plain tailstock
Pedestals: One
Finish: Nickel
"T" Rest: Tip-over
Attachments: Many attachments to fit swing tailstock
References: *Use of Lathe Attachments*
W. D. Clement Lathe Co., Waltham, Massachusetts

DERBYSHIRE

Standard Webster-Whitcomb, Derbyshire, and Derbyshire Large

See Figure 1 for Webster-Whitcomb lathe.
Chuck: W. W. 8mm and Derbyshire large 8mm body and 8mm tread. Maximum hole through chuck: 5mm for W. W. and 63.5mm for Derbyshire large
Bed: 12 inch - 15 inch and 18 inch
Headstock: Plain
Tailstock: Plain, chuck-holding or chuck-holding rack and pinion feed and other types
Swing: 3.940 inches
Height of centers: 1.970 inches
Distance between centers: 4 inches for 12 inch bed, 7 inches for 15 inch bed and 10 inches for 18 inch bed
Pedestals: One for 12 and 15 inch beds. Two for 18 inch bed
Finish: Nickel or black crackle finish
"T" Rest: Tip-over
Attachments: Slide rest, milling attachment, grinder, and all others
References: F. W. Derbyshire Catalog

DERBYSHIRE ELECT WATCHMAKERS LATHE

(See Figure 2)

Chuck: Derbyshire Magnus 10mm. Max-

imum hole through chuck: 5/16 inch or 8mm
Bed: Wider than W. W. or Derbyshire bed. Width of bed 2 inches comes in 15 or 18 inch length
Headstock: Takes Derbyshire Magnus chucks 10mm diameter
Tailstock: Plain, chuck holding, rack and pinion, screw and others
Swing: 4.7 inches
Height of centers: 2.350 inches
Distance between centers: 5 1/2 inches for 15 inch bed and 8 1/2 inches for 18 inch bed
Pedestals: One for 15 inch bed, two for 18 inch bed
Finish: Nickel or painted
"T" Rest: Tip-over
Attachments: Slide rest, milling, grinding and all others
References: F. W. Derbyshire Catalog

LEVIN STANDARD WATCHMAKERS LATHE

(See Figure 3)

Chuck: W. W. 8mm. Maximum hole through chuck: 5mm
Bed: 12 inch Webster-Whitcomb pattern
Headstock: Hard steel cone bearing, bronze, or ball bearing
Tailstock: Plain, chuck holding or rack and pinion
Swing: 3.940 inches
Height of centers: 1.970 inches
Distance between centers: Approximately 4 1/2 inches
Pedestals: One
Finish: Nickel and painted
"T" Rest: Tip-over
Attachments: Slide rest, milling, thread cutting and many others
References: Louis Levin and Son, Inc. Catalog
Louis Levin and Son, Inc. also makes special lathes to take Derbyshire Magnus 10mm chucks and larger 3c chucks.

F. LORCH (GENEVA STYLE LATHE)

(See Figure 4)

Model: Small watchmakers' model
Chuck: 6mm. Maximum hole through chuck: approximately 3.5mm
Bed: 8 inch and 10 inch, small round with flat side on back
Headstock: Regular
Tailstock: Regular with pivoting attachments and lever feed
Swing: 3 1/8 inches
Height of centers: 1 9/16 inches
Distance between centers: Approximately 5 inches on 10 inch bed and 3 inches on 8 inch bed
Pedestals: One
Finish: Nickel
"T" Rest: Solid
Attachments: Slide rest, gear cutting, grinder, face plate, etc.
References: Lorch Schmidt Catalog

MOSELY (OLD ORIGINAL MODEL)

(See Figure 5)

Chuck: Mosely 8mm conoidal shape
Bed: 11 inches long with ways in center of bed
Headstock: Hard steel cone bearing
Tailstock: Plain or with micrometer adjustment device
Swing: 4 inches
Height of centers: 2 inches
Distance between centers: Approximately 4 inches
Pedestals: One
Finish: Nickel
"T" Rest: Tip-over and solid
Attachments: Slide rest, milling attachment, jewelers swing rest, pivot polishers, face plate, and different chuck, etc.
References: *The Watchmakers Lathe* by Goodrich, and old tool catalogues
NOTE: The new Mosely that was made
(Continued on page 46)

Figure 3



Figure 4





AWI Board Hears Committee Reports

Last month, I promised a complete report on the details of the annual AWI Board of Directors Meeting, held on June 27 and 28 in Cincinnati, Ohio.

After the invocation, salute to the Flag, and special recognition of the Canadian Flag, Henry Fried delivered a special eulogy for Eric Samuel, AWI Director who died during the year. The Board authorized a memorial contribution in the name of Eric Samuel to the AWI ELM Trust Fund.

Michael Danner, Administrative Director of AWI, presented a general report on the activities during the past fiscal year. He reported that the office is functioning well and that he is pleased with the performance of the AWI personnel. Mr. Danner noted the untimely death of Mrs. Lee Rothan, an office secretary who specialized in technical information requests.

The all-important Finance Committee report was presented by AWI Treasurer and Committee Chairman, Marvin E. Whitney. Mr. Whitney reported that we finished last year with a very small surplus in the amount of \$1,605.62. He then proceeded to report on the line items in last year's budget. Any member interested in a detailed report of the Finance Committee can obtain a copy by sending a self-addressed, stamped (\$.18) business-size envelope to: Finance Committee Report, AWI Central, 3700 Harrison Avenue, Cincinnati, Ohio 45211.

The highlight of the proposed budget presented by Mr. Whitney was his indication that there would be no increase in annual dues for 1982 in spite of continued run-away inflation. The Treasurer commented that with restraint and cut-backs in some nonessential areas, the proposed new budget would see us through.

Marshall Richmond, Chairman of the Membership Committee, reported

that membership showed a gain of 366 members during the fiscal year 1980-81. Mr. Richmond could not point to any one factor which contributed to the gain; he said it resulted from the combined efforts of the entire organization. This is especially gratifying when you consider that the ranks of watchmakers have diminished considerably in recent years.

The Chairman of the New Guilds Liaison Committee, Fred Burckhardt, commented that all members of AWI should involve themselves with helping in the formation of new guilds and chapters. He requests that if you know of someone in a state or area where a guild or chapter doesn't exist, contact the person and let him know that AWI is willing to help in any way possible with the organization of their guild or chapter.

Dorothy Aderman's Good and Welfare Committee reported on the "Potomac Guild Member Assistance Program" which her committee views as having great possibilities. Through this program, local associations lend assistance to members' families in time of need. She also reported that part of the committee's work is the on-going task of searching out dependable sources for specific "hard-to-come-by" materials and services for the trade. These are published in the *AWI Watch & Clockmakers' Buyer's Guide*.

Robert Leach, Chairman of the Economic Study Committee, reported that there were 1,641 replies to the committee's survey which was mailed to all AWI members during the Spring. While the results are most beneficial to AWI in the planning of meetings and projects for its members, a copy of the report can be had by sending a SASE (business size - \$.35 stamp) to: Economic Study Survey Report, c/o AWI Central.

Charles Barnes, Chairman of the

Publicity Committee was hard at work and presented ideas for standardized watch repair tags, job envelopes, and several new ad mats. When completed, all will feature the AWI emblem prominently, making it more recognizable to the public.

Jay M. Foreman, Jr., reported on the success which the Retail Jewelers Liaison Committee has had in reaching jewelers on a regional basis. Mr. Foreman reports that with the cooperation of the incoming President of the Jewelers of America, he hopes to be able to achieve similar success on the national level.

Ewell Hartman reported on the progress his committee is making to prepare an AEI master battery numbering system. The progress is well beyond the planning stages and it is hoped that before too long, this system will be ready for use by the industry. The system will have many advantages over anything now in use.

I could continue on and on with other reports and business, but space does not permit this. Most of you who belong to an Affiliate Chapter had a delegate at the meeting; this person can report in more detail at your local meeting. The reports indicated the broad scope and varied activities in which AWI and its members are involved. One has to be impressed with the job that AWI and its committees are doing.

We reported last month on the officers who were elected for the next fiscal year; last month's *Horological Times* also reported on the honors bestowed upon several persons. I would like to add my personal congratulations to those people and especially to Mr. Hamilton E. Pease and Mr. Marvin E. Whitney who were awarded the coveted "AWI Fellow" title, the Institute's highest honor.

TIMES



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The Tower Clock, Museum of Time, Cookstown, Ontario

The story of Bob Phillip's Museum of Time in Cookstown, Ontario, Canada, would fill an entire book. The story of his clock tower and its contents—the tower clock—could take several chapters if all the historical and technical details were fully described; however, in this brief article, we will provide as much background as possible, along with a look at the trials and tribulations of installing one's own clock tower and clock.

Robert (Bob) Phillip is unquestionably one of the most qualified horologists in Canada and, for that matter, in North America. We first got to know him in the early fifties when he was working as a watchmaker and clock repairman in Toronto. Shortly thereafter, we paid a visit to his home in the city and observed that every square inch was covered with clocks, many hanging on the walls of the stairwell. Bob, working with his equally capable and enthusiastic wife, Alice, eventually moved to the country, purchasing a site at Cookstown (a 170-kilometre round trip from Toronto). Together, they started to set up their Museum of Time. The Province of Ontario apparently took note of the fact that Bob had not only a unique horological collection, but was also the secretary of the licensed Ontario Watchmakers Association. Consequently, a small grant was established for the running and perpetuation of the Museum.

On to our story of the clock. The original edifice for the housing was established as a garage and a receptacle for housing farm equipment. Around 1970, however, the Phillips got the idea of installing a clock in a tower to be built onto the north-west end of the building. The following year, 1971, the clock was acquired from the City

Figure 1



Figure 2



Essence of Clock Repair

of Lindsay, Ontario, and work by the Phillip family began. As Bob himself relates, "Labor force for this building was all supplied by members of my family." Bob, to this day, solemnly refuses to take any credit for the work done, although we observe a somewhat sardonic smile when he relates the story. "My wife, Alice," he says, "did 80% of the thinking and coordinating. My father-in-law (a "retired" English carpenter) designed and did 80% of the work; my son Robert John supplied muscle when needed: and my son-in-law, Lewis Fontaine, supplied both muscle and know-how." Bob says, "I was just the water boy!"

The clock itself was built in the Midland Clock Works, Limited, Derby, England, about 1915. It was observed, however, that some of its mechanism was made by the long-established firm of Joyce of Whitchurch, Salop (Shropshire), England. This is the same family as the infamous William Joyce who, as "Lord Haw-Haw," was the British traitor who broadcast Nazi propaganda to England during World War II.

However, I will begin with a preamble to the actual installation—just in case there are those who feel, or subsequently may feel, the urge to produce and install one of the ponderous mechanisms.

The clock tower itself was built in three main sections; Section 1, the lowest of the three, was constructed inside the garage building as a base. Sections 2 and 3 were prefabricated outside and the sides bolted on. Cedar 4" x 4" lumber was used in the general construction, with 3/4" fir plywood used for the overlaying framework. An angled portion of plywood was constructed to fit the garage roof after section 2 had been positioned. After section 3 was built, a 4-sided, pyramidal roof was constructed to fit in position on the top. The whole assembly was then covered with black felt roofing tar paper to protect everything from the elements until completion.

At this point, Bob relates that the work "had gotten to be too much for us to handle by ourselves." With a chuckle, he continued, "We arranged for the aid of a crane from Bertram & Sons Ltd. of Midhurst, set a date,

(Continued on page 34)

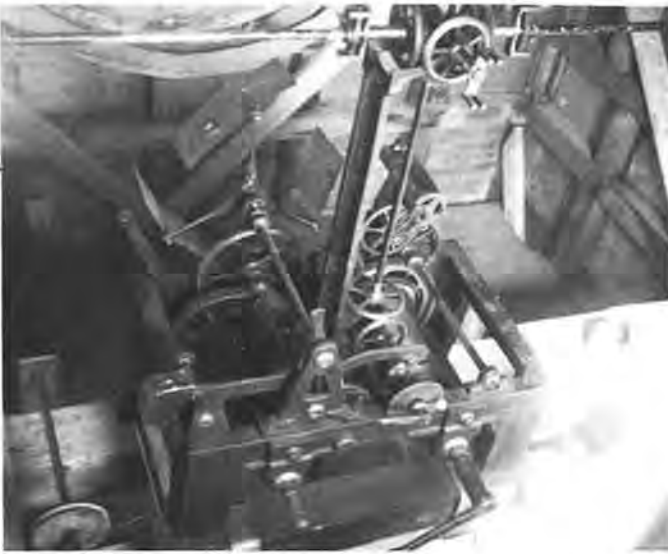


Figure 3



Figure 4

Figure 5

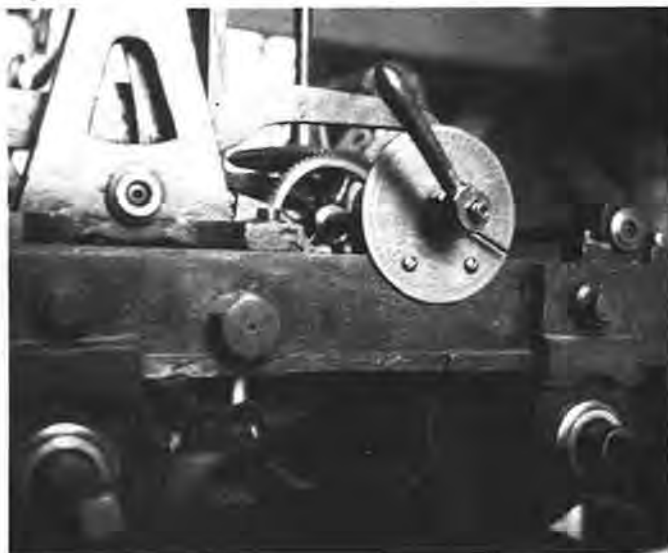


Figure 6



THE ROCK QUARRY

By Fred S. Burckhardt



TAKE-IN PROCEDURES

When was the last time you purchased a diamond, ruby, emerald, sapphire, or any other gemstone? In case you don't know, prices have gone up and will continue to rise. Yet even though many are familiar with today's prices, those at the repair counter continue to take unnecessary chances when accepting customers' jewelry for repair, giving no thought to the problems that may arise.

Why is it so important to use proper take-in procedures with customers' jewelry? As an example, let's say you take in an FF 59-21 movement for repair, and during the course of repair, something happens and the movement is damaged. You can buy another movement for about twenty dollars and at least break even or even make a few dollars. On the other hand, if you take in a customer's gemstone ring that may already have a damaged stone—or worse yet, you damage the stone—instead of costing twenty dollars to replace, it could run into the thousands of dollars. In some cases, this could cause the shop or store owner to go into bankruptcy. At least with a hold-up or burglary, your insurance will help to pay, but what about replacing a customer's stone? By adhering to a few simple rules with each job you take in, you can save yourself a lot of headaches.

TAKE-IN PROCEDURES

1. Look the item over carefully for any damaged stones, prongs, or mountings.

You can't do this with just a quick glance. Use your loupe to see if any stones are chipped, cracked, or abraded (scratched). Are the prongs worn, bent, or missing? Is the mounting itself worn so thin as to make repair impractical? If the customer wears two rings together, such as a wedding set, are they wearing each other out? If the shank is worn too thin, sizing or soldering the ring will only mean that it will be returned bent or cracked again and again.

2. List any obvious damage or flaws, both on the repair envelope and the customer's receipt.

After doing this, have the customer sign or initial the envelope—without fail. Just telling the customer won't do any good at all. In case you haven't learned it yet, customers have very convenient memories; they only remember things

they want to remember. If you list something on an envelope without a signature, the customer can say you put the notation on after they left and they knew nothing about it.

3. Never list a stone by name—only by color—unless you are absolutely sure of the stone's identity.

Why people continue to call a stone by name rather than list it by color I'll never know. Once a customer said, "Why don't you write the name? You're a gemologist so you should know what kind of stone it is." I answered, "That's why I don't write the name; because I *am* a gemologist, and I realize how easy it is to mistake one stone for another."

At the American Gem Society Conclave last year, one of the sessions was on sight identification. Sets of stones were passed out and no instruments were allowed. The stones had to be identified by sight alone. This class was filled with people who had spent many years studying gemstones, yet many of the stones were mistaken for those that are similar in appearance. At my seminars, I pass out sets of colored stones and diamonds. These sets contain at least one natural stone, a synthetic, and some imitations. As yet, there has never been one person to get 100% in GUESSING their identities. As you can see, an educated guess just isn't good enough.

You will find that many customers don't know for sure what kind of stone they have. It could be a piece given to them or passed down in the family, so its true identity is unknown. Many times they'll say it is a "ruby" or whatever because their Aunt Bessie, who just returned from a two-day tour of Siam and became a gemstone expert overnight, says it is a ruby.

If the customer insists you write the name and you are not sure, don't back down. You'll be a lot better off turning down the job. Remember, if you put down ruby and later the customer accuses you of switching stones and takes you to court, guess who will have to buy a ruby? So what if they call you stupid. I'd rather be called stupid than buy a customer something they never had to begin with!

4. If a customer doesn't want the necessary work performed, be sure to make a note of it on the repair envelope and have the customer sign it.

For example, if the prongs are badly worn and the

THE ROCK QUARRY

customer doesn't want to spend the money to get them repaired, write it on the envelope and have them sign the notation. This puts the responsibility on them. Later, when they return with a stone missing, get the envelope and show them where you brought it to their attention. They can't say they were never told.

5. Any heavily flawed stone should only be handled at the customer's risk.

Any stone in this condition can easily be damaged while it is in your possession regardless of how much care you exercise while you are handling it. Write on the envelope that the customer accepts full responsibility for any damage that may occur while in your possession. Once again, have them sign so there is no question about it later.


6. Don't take in a job if you think it will cause trouble.

If you never learn anything else, learn to turn down work that won't be profitable! Business may be slow, maybe you need the money to pay bills, maybe you need money to have you wife's belly button transplanted—whatever. Still, don't be foolish and take in something for repair on which

you'll lose money. One fellow I knew never turned down anything. He used to say, "If I can fix this, it will be a feather in my cap!" Well, I'll tell you something; that son-of-a-gun looked like an Indian chief—but he went out of business! If you are in business NOT to make money, fine. Let the rest of us know your name and we'll send these customers to you.

7. If you find you overlooked something, call the customer before you do any work on the piece.

Don't assume the customer is aware of whatever it is and go ahead without notifying them. It is better to hold the job, even until it is time for it to be picked up. Of course, the customer may be a little upset, but not nearly as upset as if they suspected you of causing the damage.

By using the procedures listed here, not only will you be protecting yourself, you can also be building up your repair business with re-tipping prongs, new shanks, replacing stones, or even new mountings. There are other precautions you can add to this list, as it is by no means complete. I've only tried to list the things that will help to keep you out of trouble. Try using them at your take-in counter and stick with them. "The money you save may be your own!" 



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The Ingold Fraise

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One of the first considerations in obtaining a good rate in a timepiece, regardless of what type, is that there be a driving power of maximum force transmitted to the escapement in a uniform manner. However, in carefully examining the train, the observant watchmaker will often discover that this essential feature leaves much to be desired.

The extreme rapidity of factory production is the cause of a great number of wheels being charged with the following defects: 1) lack of concentricity of the teeth range; 2) unevenness of the width and length of the teeth; 3) defective form of the ogives (addenda).

The different rounding-off operations done by machines using guiding-type cutters do not remove the defects pointed out, but only accentuate them further. The more one rounds a defective wheel thus, the more the defect becomes evident, especially the unevenness of teeth and spacings, or in other words, the channeling of the gearing. The only practical way to successfully remedy these errors is through the use of the pinion cutter or pinion corrector. Above all, this method offers the advantage of forming the addenda according to the epicycloidal curve which theory and practice alike demand for the uniform propulsion of the pinions.

The discovery and perfection of this very useful tool is credited to M. Ingold. In the publication *Revue Chronometrique* appears the following comment: "The invention of M. Ingold places in the hands of the artist a means

of perfecting the teeth-range, and its purpose is to give practical service in examining and repairing the train."

M. Jules F. U. Juergenson, of Locle, in the same paper, expresses himself on the subject as follows:

"One has been able to prove through theoretical demonstration that the epicycloidal form is realized through the Ingold system of rounding off. It remained to prove the real advantage obtained and its value.

"We have seen many pocket chronometers gaining in vibration around 45°, motivated by the same springs after the trains transmitting their force have been retouched by the Ingold cutter.

"An astronomical clock, running three months, required a weight 7 1/2 kil. to keep it going. Its pendulum oscillated 0°, 44'. M. Ingold interested himself greatly in manufacturing the cutters necessary for shaping the teeth of the train in this piece. After using the Ingold cutters, the pendulum showed oscillations measuring 0°, 55'; in removing 2 1/4 kil. of the weight, one obtained the same vibrations as those which the pendulum made before the rounding off."

Let us pass now to the practical way of performing the rounding off. The main piece of this system is the pinion-shaped cutter. See Figure 1.

It is a cylinder of steel drilled longitudinally in such a manner that it may be adjusted on an arbor. This cylinder is marked lengthwise by ridges, which makes it resemble a pinion from which

the rounded parts of the pinion teeth have been removed. The spaces between the teeth represent approximately the form of the addenda of the teeth on the wheel. The sides of the ridges are cut with very fine grooves while in the lathe for the purpose of "filing" the addenda of the teeth.

To proceed with the work: A cutter of suitable proportions is chosen and then mounted on its arbor; it is placed between the points A and B of the lathe. See Figure 2. The lathe is fastened in the vise by its part F. Point B is adjusted in such a manner as to regulate the position of the cutter; the wheel to be rounded is placed between the points C and D, adjusted by safety runners.

The depth between the wheel to be rounded and the pinion-shaped cutter is regulated by the thumb screw E. The forth-and-back rotating movement of the cutter is produced through the use of a drill bow. It is absolutely necessary that the greatest attention be paid in the beginning of the rounding off, and that, above all, only a very light cut is taken. It would be well for the beginner to make his first trials on large wheels.

The advantage of this system of rounding off, aside from avoiding the defects above mentioned, is to reduce the engaging gear friction to the minimum—which could not be done in the usual manner of rounding off. This is made possible by the fact that the two are here parallel: viz., that of the wheel and that of the milling cutter.

During the rounding off, the cuts on the teeth of the wheel made by the

Figure 1

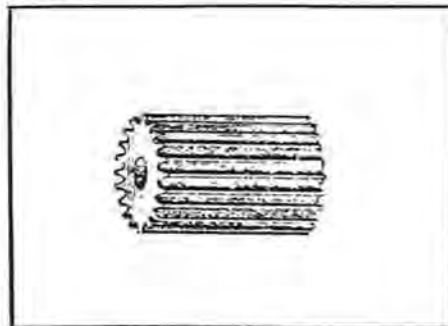


Figure 2

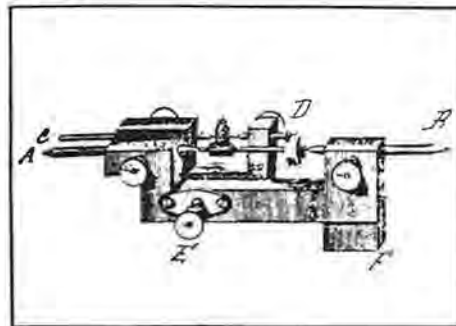
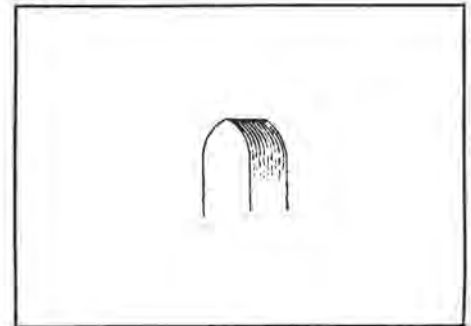


Figure 3



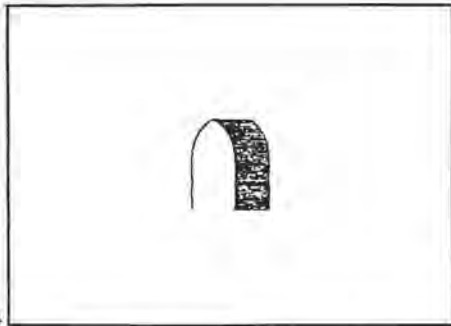


Figure 4

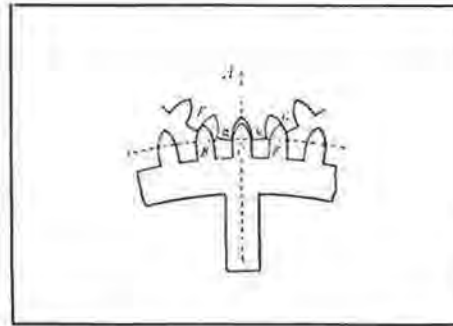


Figure 5

pinion cutter are made in the direction of the length of the teeth; in other words, in the same plane as the two movable parts. See Figure 3. This is an advantage which, through a reduction in friction, will assist the leading while the guiding-type of cutter produces the cuts crosswise. See Figure 4.

The epicycloidal form of the addenda of the teeth demanded by theory is here realized—a condition that previous practice has not strictly obtained, since each manufacturer has his special form of rounding milling cutters. The pinion-shaped cutter, through its design, permits the gearing of several teeth at a time, thereby rectifying the length of the teeth as well as the width and spacing of them.

There is not much data on the selection of a cutter with reference to a wheel of fixed size. The shortest, most exact method is to use the proportion compass. One may also choose the cutter visually, but this method demands much experience; the drawings which follow will enable the practitioner to understand more readily.

Let us suppose that we have to rectify a barrel with 80 teeth; we put it on the sector in such a manner that its diameter coincides with the division 80. The cutter will be chosen two numbers lower than that indicated by the compass; therefore, if we have a cutter of twenty teeth, its diameter will be stopped at the division 18. Since the difference of diameter of the cutters

varies very little, one may also reach three divisions lower.

We will now observe the result obtained when a cutter has been selected which is suitable to the wheel to be rounded off. See Figure 5. The tooth C of the wheel, being on the line of center of the cutter A, does not touch with the upper part against the bottom of the cutter; it must be given a slight space of freedom. The two adjoining teeth, B on the left and E on the right, are supported against the corrugated sides F and G of the cutter. This gives us the exact proportion that the cutter must have in order to obtain a good teeth-range.

If the tooth C of the wheel itself were supported against the sides of the space in the cutter with the teeth B and E resting as shown against F and G, we would have as result of our work a channeled tooth as represented in Figure 7—a certain indication that the cutter is too large.

If, for example, we had a cutter still larger, as indicated in Figure 6, our work would result in a channeled tooth notched at the beginning of the rounding of the addenda. See Figure 8.

Figure 9 represents the gearing of a too-small cutter, which would produce a tooth shaped like that indicated in Figure 10.

The use of the pinion-shaped type of cutter will render great service to the worker who desires extreme precision in gearing. It is equally useful to

the general repairman in eliminating, or at least reducing the faults in gearing of many timepieces, which often create stoppages that are difficult to detect. The easy handling of these cutters, and especially their moderate price, now offers every watchmaker a means of filling a gap which was previously impossible to fill.

At the time this was written, we were again back to the six-leaf pinion in the small wrist watches. As each tooth of a six-leaf pinion must be driven through an arc of 60° before the next tooth takes hold, some of the driving must be done before the pinion leaf reaches the line of centers. If the epicycloid curve were generated on the wheel tooth so it would drive the pinion 60° from the line of centers, the wheel would be so large that the teeth would lock horns with the incoming pinion leaf. Therefore, driving before the line of centers is necessary, and as there is a certain amount of wedging and friction involved in this before-the-line-of-center driving, it is highly important that the teeth be smooth.

The lines left by the cutter on the wheel tooth, which are at right angles to the movement of the wheel, have been known to actually stop these small watches when cleaned in high test gas alone—the gritty surface stopping the wheel while in the act of the frictional driving before the line of center. Some watchmakers have rolled the teeth of the wheel upon paper having a thin smudge

(Continued on page 30)

Figure 6

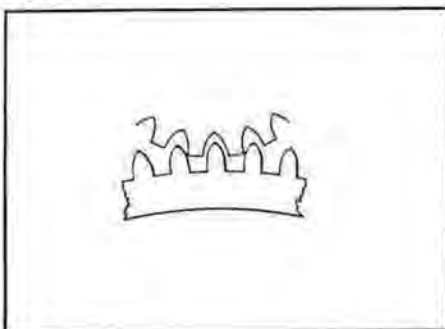


Figure 7

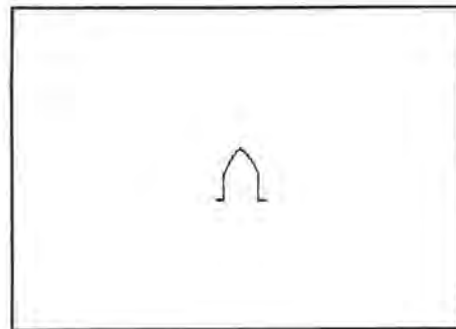
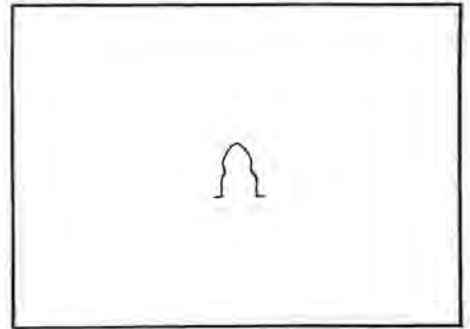


Figure 8





German Clock

Q I need some information on a clock which I have been repairing recently. It has a break arch top with bun feet at the bottom. The finish is very dark with little ornamentation about the case. The dial is painted gold with black painted numbers. It is attached to the movement with locking levers. The weight shells are also painted gold on brass.

The movement is a bim-bam strike in good condition. It is stamped with the letters A,J,K in a triangular arrangement. A gear encircles them. The number 71081 is at the bottom. The escapement is a Graham deadbeat with adjustable pallets. The pivots of both the escape wheel and pallet fork are set in adjustable bushings. Even the strike hammers have knurled adjusting and locking screws. Any information would be appreciated as to the origin and manufacture of this clock.

Jeffrey Worth
Overland Park, Kansas

A Your clock was made by Joseph Kieninger of Aldingen, West Germany. It appears to be of the 1920 period. The company is still in business at: Jos. Kieninger KG, Uhrenfabrik F 2096, Aldingen, West Germany.

There is little more I can offer. It appears to be nicely made and should lend itself to easy repair. It is best not to mess with those adjustable screwslot bushings.

Q After a complete overhaul, will some Seth Thomas A-300 electric strike movements still have a noticeable motor noise like a low rumble?

On my repair in question, I have completely disassembled the movement and hand-cleaned each wheel, point, and bushing. I burnished those bushings which were not worn, polished all time wheel pivots, and rebushed all worn bushings. Of course, I changed the motor, TWICE, and finally I substituted



a newer fiber gear that meshes to the motor from another A-300 that does not make noise. I also put a medium-heavy grease on the fiber wheel teeth. While the noise has been greatly reduced, it is still present. Is there any further repair that will eliminate any more noise—or could this be the normal operating noise that can be expected from this movement?

Thanking you in advance.

Edward Walker
Cumberland, Rhode Island

A I am not familiar with the S.T. A-300 electric strike. However, you realize that the clock was originally designed and engineered to run without the hum or noise.

If you are familiar with clock gearing and have access to a clock depthing tool, you might mount the two wheels in question on the depthing device, and with the same depthing you now have in clock plates, see whether this hum or grinding noise also takes place under magnified scrutiny while in the depthing tool. If it does, try adjusting the depthing tool until you have a good, smooth engagement and one that is noiseless. If you can do this, then obviously your depthing is poor and perhaps when you rebushed your clock, the rebushing was not done so that the wheels are in perfect depth. If that is the case, plug up the hole you've rebushed and drill your holes by the points you get from the depthing tool's transfer to your clock plates.

If the depthing tool adjusted still doesn't eliminate the noise, then you must suspect wheels that aren't round or teeth that are not shaped properly. Since you don't complain about the timekeeping, I assume then that the wheel count of the teeth is correct. The depthing tool can allow you to get in very close with a loupe to see how the teeth mesh with each other.

Grease only masks the real problem. Often, noise in electric clocks (I assume A.C. driven timepieces or
(Continued on page 25)

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Repairing And Replacing Watchcase Push Buttons

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By Louis A. Zaroni

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I would like to thank Henry B. Fried for all of his help in designing the Zantech-Fried Button Press and for preparing the sketches for this article.

The watchcase push button is a spring-loaded plunger mounted on the side, front, or back of a watch case. See Figure 1. Its primary purpose is to make electrical contact with the watch module when pressed by the user. This is the means by which the watch is used and/or adjusted. When a watch is functioning properly, buttons are used to display additional information that is available within the integrated circuit, such as date, alarm time, or stopwatch function. Due to the high current drain of the LED display and the night light of an LCD, the buttons are also used to activate these features whenever desired.

The function of the button is to complete an electrical circuit to the IC when it is pressed. Generally, the IC is programmed to perform specific functions when the case button makes contact with the module. In some watches, the button moves two contacts together on the module to complete the circuit.

The IC is an electronic device, and it requires an electronic impulse in order to respond. The watches that have movable contacts mounted on the module do not require a metal button to complete the circuit. A plastic button can be used to move the two contacts together. This type is primarily used in the inexpensive plastic-cased watches.

The majority of watches use metal cases and metal buttons. It is, therefore, convenient to use the case to complete the electrical circuit from the button to the module. The plus terminal of the battery is usually connected to the case, and the metal button is press-fitted into the case, making electrical contact to it. Therefore, the plus battery terminal and the button are electrically connected together. When the button is pushed in, it makes contact with the

switch terminal of the module. This connection does one of two things to the module: either it applies a plus voltage to the switch contact, which is electrically connected to the IC and the IC responds, or it shorts the negative voltage of the switch to the plus terminal of the case, cancelling out the negative voltage on the switch terminal. This causes the IC to respond. The second method is the most common. It can easily be identified by the fact that the switch contacts have a negative voltage on them at all times.

Even though all circuits are not electrically the same, it is merely necessary to insure good electrical contact to the module for the module to respond, regardless of the method used.

When troubleshooting a watch, it is important to determine that the problem exists with the button and not with the module before attempting to repair the button. Although most of the time, button problems are obvious—either broken, jammed, or missing—occasionally, the problems are electrical and associated with the module. For this reason, it is important to test the module before working on the buttons.

If the module is not functioning properly, repairing the button will not solve the problem.

TEST PROCEDURES:

Regardless of the condition of the button, a systematic test procedure should be followed prior to doing any work on the button:

1. Physically examine all buttons and determine which ones require servicing.
2. Remove the caseback.
3. Microscopically examine all of the button contact points on the module before removing the module from the case.
 - a. Are they contacting the module switch when pressed?
 - b. Do they separate from the module

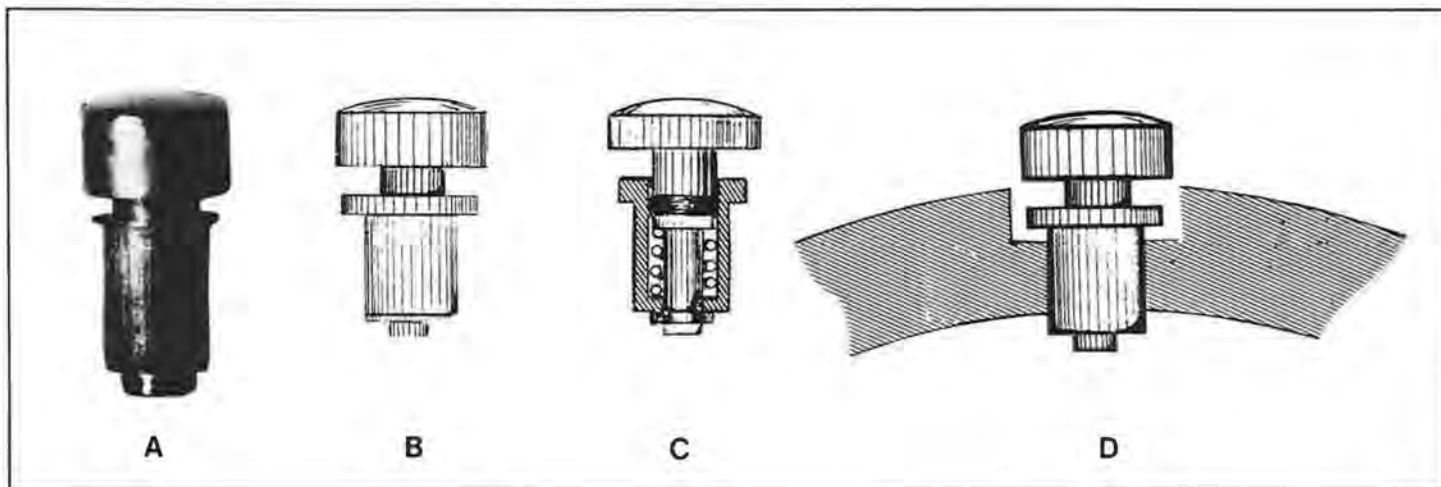


Figure 1

- switch terminals when released?
- c. Are the module contacts and button plungers clean?
 - d. Are the module contacts properly connected to the module?
4. Remove the module from the case; remove the battery from the module and test the module completely. (See "The Digital Watch Troubleshooting Guide," *Horological Times*, February and March, 1981.)

Do not perform any work on the button until you are certain that the module is functioning properly. It would be wasted effort if the button were replaced and then the module were found to be beyond repair. The customer may not choose to pay the price of a new module and a button repair. **Tip: Test the module and examine it visually before repairing or replacing the button.**

BUTTON STRUCTURE:

In order to service watch buttons, it is my opinion that a thorough understanding of them is necessary. Therefore, we will begin by describing the three basic types of button assemblies.

1. **The self-contained type.** See Figures 1 and 2. This type is a permanently assembled unit that contains all of the necessary components for a spring return movable plunger. See Figure 1, View C. This type is press-fitted into the wall of the case. See Figure 1, View D.
2. **The C clip type.** See Figures 3 and 4. This type of button structure is very similar to the self-contained type, except for one major difference: it can be easily disassembled and re-assembled for cleaning and lubrication. See Figure 3. Most of these buttons

are press-fitted into the case wall in the same manner as the self-contained buttons.

Other variations of this design use the case wall as the barrel of the button. It is very important to determine which type of button is being serviced.

3. **The springless type.** See Figure 5. This type uses a leaf spring on the side or front of the module to release the button. Its structure is the simplest of all. It consists of a solid metal or plastic plunger, pushed into a hole in the side or front of the case. A rubber "O" ring around the plunger prevents water from entering the module. A flange on the inside of the plunger prevents it from falling out. It is used to push on a leaf spring connected to the side or front of the

Figure 2

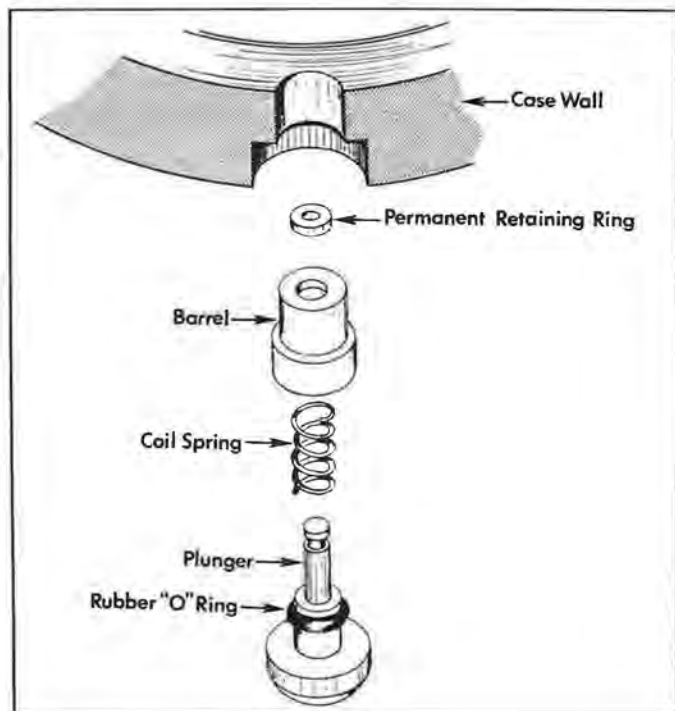
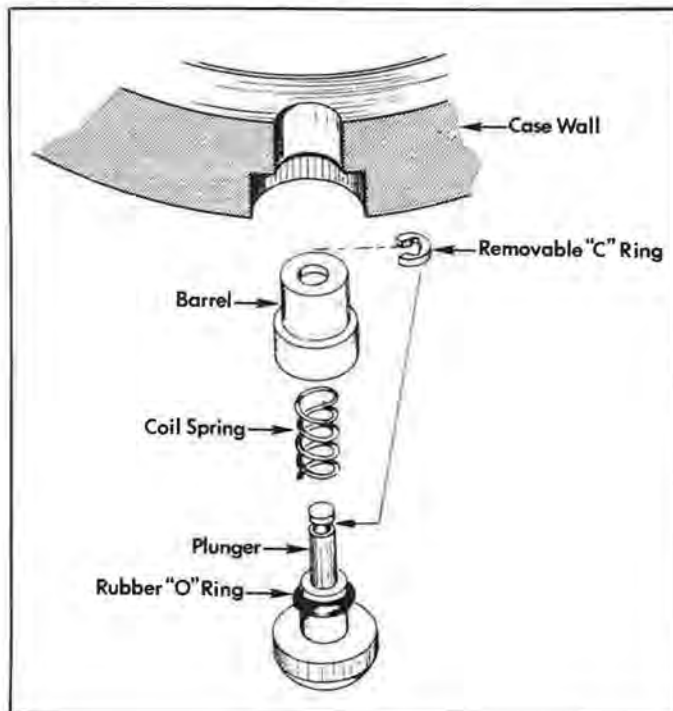


Figure 3



(Continued on page 54)

By Marvin E. Whitney, CMC, CMW, FAWI



American Chronometer Makers

Part XI

We continue our discussion of American chronometer makers with more on the career of Wilfred O. White and the Kelvin & Wilfred O. White Company.

On October 21, 1939, the Observatory purchased six White chronometers, Nos. 15554, 15570, 15571, 15573, 15574, and 15575, for \$375 each. These were all Mercers, imported from London during this uncertain pre-war period. Then, in a letter dated June 29, 1940, Superintendent Captain Hellweg notified White that all thirteen chronometers submitted for trial had passed. The maximum daily rate was 1.26 seconds; 2.00 was allowed. Most of them had an error of less than a second per day. W. O. White responded by saying, "... it is something to be proud of, especially when you consider the conditions under which the Mercer Company is laboring in London at the present time." The purchase price for these thirteen instruments was \$325 each.

White sold the firm in 1958 to Danforth, a nautical instrument firm, after turning down the pleas of several employees that they be allowed to purchase the firm. However, Danforth was more interested in yachting and boats than in the servicing of chronometers, compasses, sextants, and the sale of nautical software. Therefore, in 1963, Herbert Maisler (now president) and his partner Arthur G. Spina, both of whom had previously worked for White, purchased the White operation from Danforth; it became the New York Nautical Instrument and Service Corporation, at 140 West Broadway, New York City.

They continue to offer all of the services that were previously offered by the White firm. They are presently the only firm in New York that offers the repairing and rating of chronometers. Mr. Walter Vehle, who was a chronometer maker with Negus and later with White, is in charge of the chronometer department. He is a very excellent and skilled craftsman and a most interesting and knowledgeable person.

The firm offers a full line of charts, logs, books, and instruments or apparatuses used by today's mariners. They also repair and adjust compasses, collimate sextants, and repair and adjust barometers. Mr. Maisler is a very pleasant and knowledgeable individual with whom

to converse—not surprising since he has been actively engaged in dealing with nautical instruments and mariners' problems most of his life. The firm and the staff under Mr. Maisler's leadership certainly stand ready to serve mariners' needs and interests at any time.

WILLIAM S. WILLARD & SONS, 9 Congress Street, Boston, Massachusetts. The Willards not only repaired and serviced chronometers, but they also sold other makers' instruments—under the original name and not theirs. They were agents for Thomas Cotterell, London, and John Poole, Liverpool.

On April 1, 1840, the Naval Observatory notified Willard that three chronometers, Tobias 327, Cummin 35/21, and Parkinson and Frodsham No. 592, had completed trial and would be purchased. A year later the Observatory notified Willard that the three chronometers submitted for trial by Thomas Cotterell were completed and trial numbers were as follows: No. 891 – 8.15; No. 890 – 8.33; No. 865 – 11.78.

When the Civil War appeared to be imminent, Willard and several other makers were requested by the Naval Observatory to furnish price lists on a variety of repairs to chronometers. All firms were requested to forward the daily comparison of rates and also extreme temperatures during the last three months of all chronometers they would be willing to sell at a price not to exceed \$225.

In November 1861, Willard wrote the Secretary of Navy regarding his connections for securing instruments from abroad and offering his service as the Secretary might deem necessary.

On November 22, 1861, Superintendent Gilliss, responding for the Secretary, wrote, "Your offering of chronometers is a most liberal one, and when it was made known to the Honorable Secretary of Navy, the patriotic spirit shown by you received his warmest commendation. It will scarcely be necessary to import any additional number of instruments. There are numerous instruments in the country, and I have every confidence that the power of the Government will be such before the Spring that we may diminish the number of vessels afloat. There may and possibly will be guerrilla warfare many months longer, headed

THE SHIP'S CHRONOMETER

by the arch traitors, but the masses will have recognized the value of a protecting government."

On January 4, 1862, Willard was directed by the Naval Observatory to deliver to Negus, the Navy's New York Agent for the keeping and issuing of chronometers, nine instruments: Charles Frodsham 2831; John Fletcher 2120; and John Poole Nos. 1862, 2426, 2600, 2630, 2639, 2704, and 2710. At an earlier date, he had been directed to deliver to Negus, Poole's Nos. 1540, 1861, 2007, 2171, and 2381.

With this, we conclude our series on American chronometer makers.

QUESTIONS AND ANSWERS

(Continued from page 20)

motor-driven clocks) is due to worn wheel teeth or bushing holes worn excessively. This, in time, becomes further aggravated when the tips or flanks of wheel teeth also become worn as a result of the pitch becoming incorrect.

A clock, electric or otherwise, when in good condition, should not groan or become noisy due to wheel teeth enmeshing. Look again quite closely at the depthing, uprightness of the wheels, uprightness of the arbors, play in the pivots, or warpage on fiber gears.

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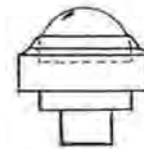
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4	WGF	RED	10	3.75mm	13	YGF	RED	10	4.5mm
5	WGF	BLACK	10	3.75mm	14	YGF	BLACK	10	4.5mm
6	WGF	BLUE	10	3.75mm	15	YGF	BLUE	10	4.5mm
7	YGF	RED	10	4.00mm	16	WGF	RED	10	4.5mm
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Presently, Cas-Ker is a full-service supplier of materials from Seiko, Pulsar, Rolex, Omega, and many other manufacturers. Their substantial jewelry department allows their customers a wide choice of goods. And a recent space expansion to 10,000 square feet, nearly twice the area occupied previously, allows for future growth of the company.

John Cassedy, President, said that the company came to a crossroads a little more than a year ago, when they were informed by the manufacturer of the billing and accounting equipment that a major machine would have to be replaced. This prompted Mr. Cassedy to learn all he could about computers. With all the duties of administering the activities of the supply house, he realized that he could not gain enough knowledge for him to select the proper computer equipment to fit the needs of the organization. Calling on his basic computer knowledge, he selected and hired a consultant to search out the proper machinery. After considering a half-dozen systems, Data General Equipment was selected and delivered three months ahead of schedule.

To date, general ledgers, accounts payable, accounts receivable, and payroll are programmed. Order entry is presently being programmed. Mr. Cassedy said that the monthly balance sheet, profit and loss, and sales analysis by categories of merchandise gives fast and accurate information to determine trends in the industry.

(For more pictures, see page 52)



Above: John Cassedy, President of Cas-Ker Co. and Immediate Past President of WMJDA. Right: Leo Stechenberg preparing bimonthly "UPDATE" publication. Below: Lou taking order in material department.



Pat filling ring order.





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Thank You, *Louis A. Zanoni*, President

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DISCOUNT COMPETITORS

John Ruskin said, "There is hardly anything in the world that someone cannot make a little worse and sell a little cheaper, and the people who consider price alone are this man's lawful prey."

Unfortunately, the people who habitually patronize discount stores probably have not heard of John Ruskin and would not believe that these special, so-called "discount" prices could possibly give them cheaper quality merchandise—without adequate warrantee service.

Many jewelers blame the discount store for *their* lack of business. I visited a jeweler who lead me to his front window and then pointed to a discount store down the street, blaming the discounter's existence for HIS lack of business. He wasn't quite as concerned about his fellow retail jeweler competitor across the street, who sold good merchandise at fair prices.

Actually, even that jeweler across the street would not be his only competition, as competitors are not necessarily in our own line of business. How about the clothing store, the furniture store, the car dealer, and even the doctor or dentist? They do not sell jewelry, but they do compete for those same customer dollars. How many times have we heard our potential customer explain that their decision not to make a purchase from us was due to a furniture buying decision or a need to pay the doctor's bill? We have a multitude of businesses and professions competing for our customers' dollars.

On the other hand, many times our customers have sufficient funds to make all of their desired purchases, and therefore the all-too-familiar expression, "I can't afford it," may be just an excuse. Why would anyone tell us they can't afford something when they really can? Maybe these words roll out of their mouths by habit, or maybe they feel that this relieves the pressure. Maybe they are really saying, "Show me. Tell me why I should buy."

Now, after all of our "show and tell," if the customer still does not buy, our natural reaction is that there is something wrong with that customer. However, maybe it's our fault. Have we ever in our lives thought that just maybe we might be the ones in need of changing?

There is a saying that losing a sale is not so bad if we know the reason why. The fewer losses the better, of course,

DATE _____ SALESPERSON _____ NO. OF CUSTOMERS _____ NO. OF PHONE CALLS _____	Y = YEL. W = WHITE L = LADY M = MAN G = GOLD SS = STERLING C = CUST.	L.S. = LIMITED STOCK O.S. = OUT OF STOCK D.S. = DON'T STOCK P. = CUSTOMER FELT PRESSURE U. = WE UNDERSOLD P.S. = POOR SERVICE N.C. = NO CONFIDENCE	J.L. = JUST LOOKING N.M. = NO MONEY I = INFORMATION ONLY F = FUTURE PURCHASE O.P. = OTHER PEOPLE D = DON'T KNOW					
↓	↓	↓	↓					
NAME		- SALES -		- POTENTIAL -				
ITEMS	AMOUNT	CASH	CHG.	L.A.W.	CREATIVE	MEMO	HOLD	REASON NO SALE

Figure 1

so maybe we should review each lost sale and analyze it by asking ourselves some of the following questions:

- 1) Does our price seem too high?
- 2) Did we fail to explain the quality of our merchandise and service?
- 3) Is our customer really "just looking," and why did we not close the sale?
- 4) Is our stock selection too limited?
- 5) Are we out of stock or maybe we do not stock those items?
- 6) Did we introduce ourselves to our customers and remember their names, using them in our sales presentation?
- 7) Did the customer feel pressure?
- 8) Were we "underselling?" Was the customer interested in a more expensive item, but we falsely "type cast" them into a lower price range?

The above questions are some of the reasons for customers not buying from us. It would be beneficial to us to have a way of recording these reasons. For this purpose, I have devised a system using 3 x 5 in. cards. See Figure 1. Although such cards or pads or books are usually designed to record sales made, my purpose is to record potential sales or lost sales. You are welcome to copy these cards and modify the copy to fit your personal needs.

This system does not replace our regular sales books; in fact, its use should probably be limited to large items, such as diamonds, nice jewelry, and watches. It could be used for small items such as watch bands when it is necessary to establish which items are selling best.

Let's look at this card system. Each card may be used for just one customer or for a number of customers. The columns under "Sales" are divided into Cash, Charge, Lay-a-

way, and Creative. A creative sale involves merchandise other than that which a customer came in to buy. Maybe a customer wanted a watch repair, and we suggested a new watch which he bought. This is a creative sale. Maybe we also suggested a special band to add to this watch. This additional sale is also a creative sale. Remember, suggestion is not pressure. However, if they say no and we proceed to try to sell, we are stomping on the pressure ground and may lose the sale.

Now we come to the most important section, the right-hand side of the card labeled "Potential," and under that, "Reason No Sale." The reason is important in order to help us improve in the future. We may never really know why a certain sale was lost, in which case selecting from one of the thirteen reasons listed may be close to a guess, but the most likely reason should be considered.

To use this column, simply write in the initials indicating the reason. For instance, let's suppose we are out of stock, so we put an "O.S." in that column. If we eventually see too many "O.S." markings on our cards, we had better stock up. As for the "Memo" column, making a note of the color, number or model of an item in which a customer seemed interested will remind us to show this item again if the customer returns. In such a manner, many potential sales do turn into real sales—that is, if we play our cards right.

So may I suggest that you try the cards. Maybe you will agree that we should stop worrying about the discount competitor and secure our share of business by using all available good business methods. And, as always, don't be afraid to suggest to your customers that they buy now.

Buy now,
Wes

IN THE SPOTLIGHT

(Continued from page 19)

of oil on it to produce just the faintest film of oil to offset this wedging. The Ingold Fraise smooths the teeth because the planing is in the direction of the lines of transmission and therefore obliterates the lines left by the cutter when the wheel was made.

In using the Ingold Fraise, it will be found that a number of the fraises have the same pitch but are of different diameters. It is well for the

repairman to experiment on a number of wheels, cutting only half-way around and then comparing the cycloids so as to produce the same shape of tooth. Once the repairman understands the different number of leaves in pinions requiring different addenda, and also the different ratios requiring different curvatures, he will be able to thoroughly master this valuable instrument, the Ingold Fraise.

Most trains have the epicycloidal form of teeth, but some have the equi-potent. In the latter, the transmission of force is even more uniform than in the former, but there is a little drop which sometimes wears the pinions.

In watching the arcs of the

balance wheel and its periodical accelerations and reductions, it will be easy to determine whether the barrel or center wheel has faulty transmission of force.

Sometimes in repairing watches in which the train recoils with apparently perfect freedom, on inspection of the wheels, it will be found that only one or two teeth are bright on the side of the tooth not used, being proof of insufficient clearance. The Ingold Fraise will reduce these high teeth without affecting the others. The real solution of uniform transmission of force in trains having six leaf pinions lies in teeth inclined from the vertical and cap-jeweled thrust bearings.

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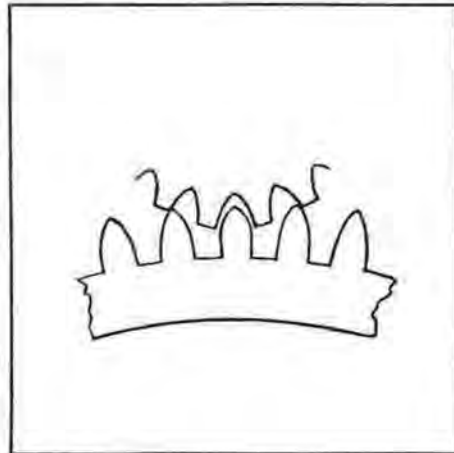


Figure 9

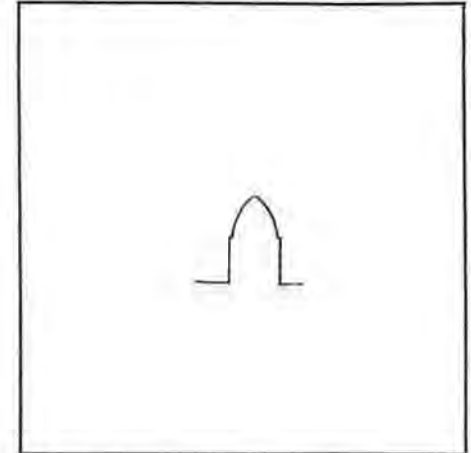



Figure 10



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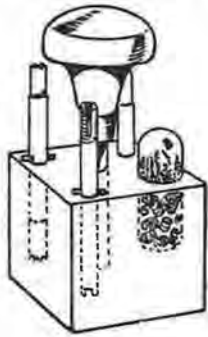
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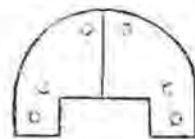


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THE ESSENCE OF CLOCK REPAIR

(Continued from page 15)

and on the day before the crane arrived, cut out part of the garage roof to accommodate section 2."

During the process of craning the sections into position, however, it was discovered that one dial, together with the dial train and hands, had been damaged beyond immediate repair. This damage had apparently occurred during removal of the clock from its original location in the post office building in Lindsay. At this point, it was decided to mount the clock using only three dials instead of the originally intended four. The crane went to work again; the assembly was lifted but it tilted unevenly. The section was then lowered again, and the uneven side (minus dial, dial train, and hands) was balanced by weighting it with the clock weights and heavy pendulum bob. This corrected the tilt. The clock assembly was rehoisted and it fit into position. Everything was then bolted together and inside braces fitted to support the tall structure from strong winds, "predicted by the day's weather report." As Bob related to us, "The entire family waited in suspense, biting fingernails," whilst 50-mile-per-hour winds blew across the terrain. However, when all had subsided and the family rushed out for inspection, it was discovered that the tower had remained rock-solid and was unmoved.

A staircase was ground-constructed and installed. However, Robert John Phillip (better known by his father as "Number One Son") finally clambered up to the pinnacle of the tower to secure a "crowsingly triumphant rooster" weathervane. The assembled edifice, as you see it today, is shown in Figure 1.

Let us now return to the actual mechanism as we found it installed in the tower. Lighting for really good photography was lacking and we probably should have hauled up some extra lighting equipment. However, Figure 2 does show the clock's unusual pinwheel escapement, the pallet set off to the right. The wheel immediately below the pinwheel (partially seen) is the power-maintaining wheel controlled by a ratchet and accommodating tension spring. With such an escapement, it is most necessary that such maintaining power be employed; otherwise it would be necessary to stop the clock and secure the escapement before winding.

The arrangement of the actual time train is shown in Figure 3. The pinwheel and pallet are over to the right of the train; the power-divider arrangement is at the top-center of the photo, and in the front center is the pilot dial.

The power-divider is shown in detail in Figure 4. The pilot dial is also shown in detail in Figure 5. We shall proceed to briefly describe the functions of each.

The minute hand drive for the power-divider (Figure 4) is done directly from the clock. The power-divider in this case is set up to operate three (originally four) separate dial gear trains. One will recall that we lost one arrangement because of prior damage.

The pilot dial (Figure 5), engraved with 60 minute divisions, is a convenience engineered with the clock: 1) to set the clock; 2) to adjust the time from inside the tower to match the outside dials. It was also observed that the pilot dial was engraved in reverse to accommodate this purpose without confusion.

To the left of the pinwheel and only partially seen in Figure 2 is a gear and clutch arrangement. The clutch allows repositioning of the gear in relation to the pilot dial when resetting the time on the clock dials. A pilot dial crank key is also supplied with the clock for time setting purposes. This key also becomes a distinct convenience during the arctic-cold Ontario winters, when it can be racked back and forth to clear ice and snow on the dials.

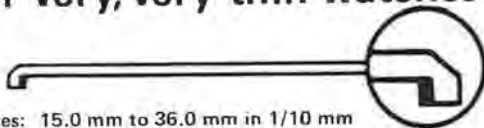
Inasmuch as the large clock hands are exposed to the elements, they are counterpoised to relieve the forces on the mechanism. See Figure 6. The minute hand counterpoise on each dial is opposite the hour hand counterpoise. As mentioned, the minute hands are controlled directly from the clock and, for the hour, are reduced by the dial train in the usual 12-1 ratio.

The strike mechanism of the Phillips' clock is not

(Continued on page 39)

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Handcrafting a Hinged Name Bracelet

Part II

In last month's article, I explained how to make a hinged identification bracelet with large letters spelling the name and connecting links making it long enough to go around a wrist. In this article, I will explain how to make a fine-quality, durable catch; I will also explain how to use heavy ident chain instead of the connecting links made last month, and how to use a sister hook instead of a catch.

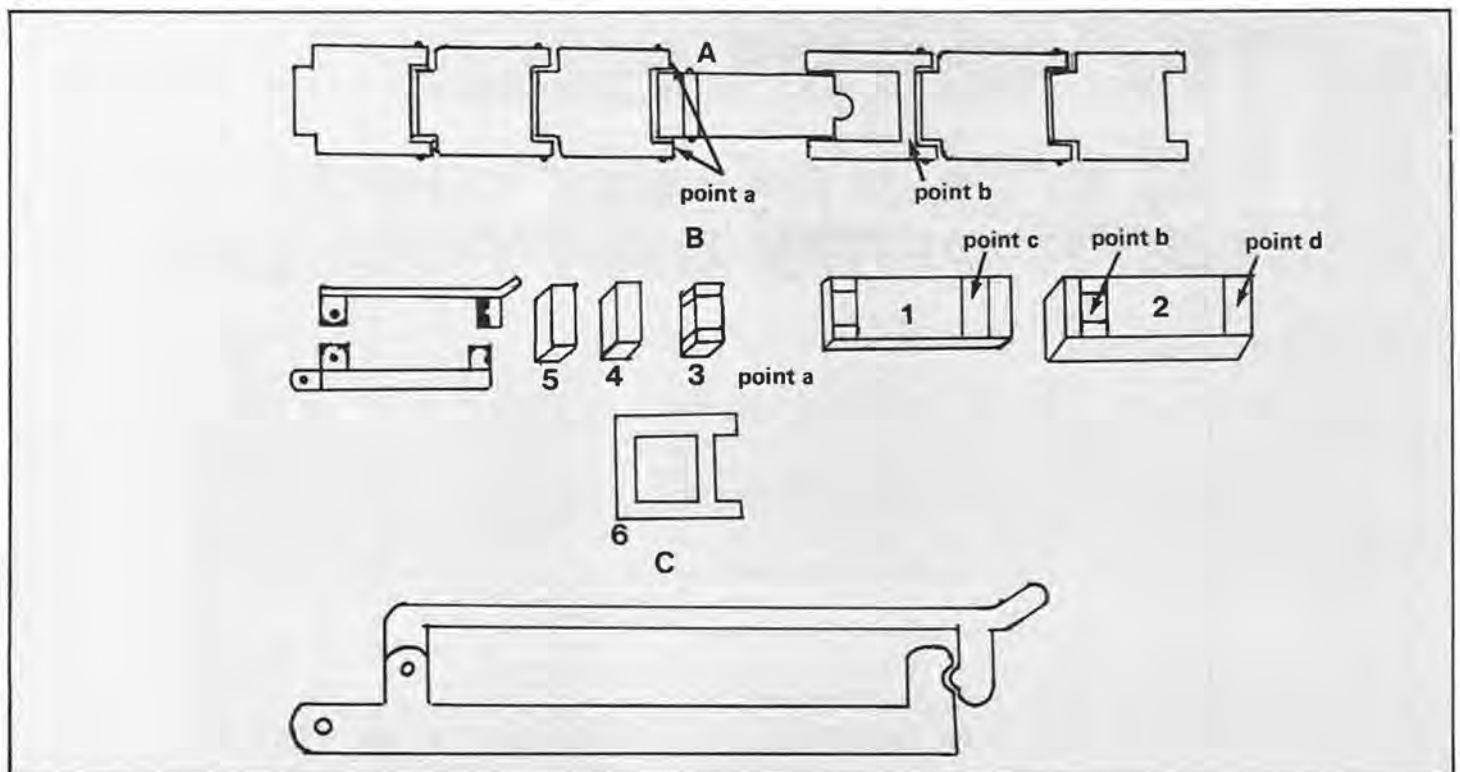
The type of hinged link used in the bracelet in last month's article can be matched with a foldover catch that will be as wide as the distance between the outer hinge lugs on the female end of the bracelet links. (Each link has a male and a female end.) See Figure 1, View A, point a. When the bracelet is ready for the catch, the catch is made to fit the female end; an open link is made to attach to the other end (male end) of the bracelet. See Figure 1, View A, point b. The catch will fasten to this open link.

The components can be made from 1mm and 2mm gold or silver sheet, using .9mm brass or nickel silver wire for

the hinge pins. The parts to be made include: 1) lower plate; 2) upper plate; 3) hinge piece; 4) lower catch to be soldered to lower plate; 5) upper catch to be soldered to upper plate; 6) open link for the catch to fasten to on the other end of the bracelet. Numbers 3, 4, and 5 are identical small blocks of gold or silver, 2mm square, but number 1 (the lower plate) is 2mm thick, and number 2 (the upper plate) is only 1mm thick. The length of the catch should be about the same as the links in the bracelet, and the width is determined by the width between the female end lugs.

Using 2mm metal sheet, lay out with a scribe the lower plate, the three identical pieces (3, 4, and 5) and the attaching link. Next, with a piece of metal 1mm thick, lay out the upper plate. After these are marked, saw out the pieces with a jewelers' saw, being careful to keep all pieces square or rectangular. The open link (6) will have to be drilled, and one end of the saw blade removed from the frame and put through the drilled hole in order to saw out the center portion of the

Figure 1



THE PICKLE BARREL

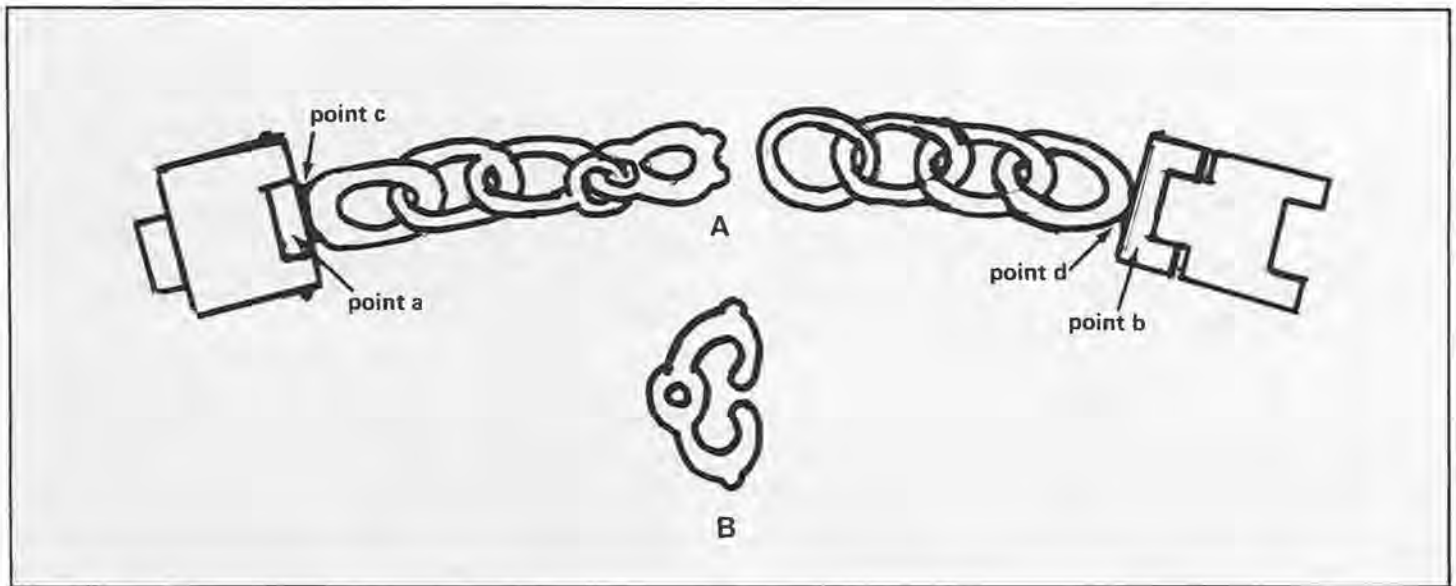


Figure 2

link. One of the identical pieces can be sawed into three parts to make the hinge of the catch; it can be sawed in half to make the center or male portion of the hinge, and the other half can be sawed into two equal pieces to make the ends or female portion of the catch hinge.

Assembling the components is next in order. Lay the top and bottom plates on the asbestos pad, aligning them in their proper positions. Mark them or make a mental note of where they go. Remove them, heat and flux those spots, being careful not to let the flux extend beyond their seats. Next, each piece that is to be soldered can be fluxed and a small piece of gold or silver solder flowed on the surface to be soldered to the plates. Soldering and aligning can be done all at once if you have the skill and experience to place the soldered surfaces on the places that are fluxed. Then heat until the solder flows and use a pick while still applying heat to move any pieces that are not aligned perfectly. If you do not have this skill and experience, then the pieces can be installed one at a time using the third-hand tool to hold each component in place. When installing one piece at a time, it is wise to pickle, rinse, and reflux after each piece is soldered in. This will keep the solder from flowing on the joint that has already been soldered in place. Figure 1, View B shows the locations of the components: point a indicates the female lugs; point b indicates the male lug; point c is the upper catch; point d is the lower catch.

In using pickling solution, the same results can be obtained by quenching while still hot as by using a hot pickle solution; there is no waiting as it can be dipped in the pickle, then dipped in water, and be ready to flux and solder again. In soldering the components together, remember that if one component is hotter than the other, the solder will flow to the one that reaches the temperature of flow first; therefore, play the heat around until both parts reach the temperature of flow at the same time.

In positioning the outside end catch on the upper plate, allow for the metal to be filed away, leaving a ridge to fit a depression that is filed in the inside catch piece on the

lower plate. In locating the upper catch piece, it must be set in from the end on the upper plate, leaving about 3mm extending for a lip that will be rounded and bent up slightly to serve as a place to get a fingernail under in order to open the catch when finished.

Filing is the next step. All outer edge surfaces need to be rounded slightly on the corners; the hinge parts should be rounded, and the catch pieces need to be shaped with a half round protrusion on the upper part and a half round depression filed into the lower piece to match. This will create a snap when finished and assembled. Also, file the hinge components, making the ends half round and the hinges fit together snugly.

When the filing and shaping is completed, the holes need to be drilled for the hinge pins. Drill the female lugs first; then fit the hinge together and, through the hole already drilled in the female lugs, drill into the male lug from each end just enough so the drill will not slip when finishing the drilling. Drill the hole the rest of the way from first one end and then the other until it is all the way through the male lug. Then fit the hinge together and align with a tapered pin. (A needle of the correct size works well for this.) A number 63 drill works fine for this and will accommodate a .90mm hinge wire.

Figure 1, View C shows the finished catch (not attached to the bracelet) with a side view. This is how it should look when finished. It is necessary to drill two sets of holes in the catch as the catch itself is hinged, and the male lug that fits the female lugs in the bracelet must also be drilled. The link to which the catch fastens (Figure 1, View B, number 6) must also be finished by filing away all rough edges and then drilled to fit the bracelet. Both the link and the catch should be drilled to match the holes in the bracelet ends. The catch can be drilled using the holes in the female lugs in the bracelet as guides, but the hole in one end of the female end of the link must be drilled first. This way, the hinge can be put together and the other end drilled by pushing the drill through the male lug to get perfect alignment.

THE PICKLE BARREL

At this point, all pieces should be ready for polishing so this can be done on the polishing wheel with tripoli and rouge using whatever felt, cotton, or brush buffs are necessary. An alternative to polishing small items such as these is to use small mandrel-type buffs in the flex shaft tool with the same abrasives. After polishing, assemble by using brass wire for gold, or nickel silver wire for silver, about 9mm in diameter. One end can be made into a rivet head by putting the wire in a pin vise or a number 9 chuck in the watchmakers' lathe, leaving about .5mm protruding. Peen this protruding end with the round end of the chasers hammer. Cut the wire plenty long, make a point at the end so it will go through the hinge easily, and install in the hinge. Cut off the excess, leaving about .5mm protruding. Place on a steel anvil and, with the round end of the chasers hammer, peen this end to complete the rivet.

After all rivets are installed, the ends can be improved by using a cup bur of the proper size in the flex shaft tool to make a perfect dome of the end of the rivet. As all the inside surfaces were polished before assembling, a final polishing of the exterior surfaces can be done easily on the polishing motor with tripoli and rouge abrasives. If engraving is necessary to match the rest of the bracelet, this should be done before the final polishing. Clean well in an ultrasonic tank or brush in a soap and ammonia solution or a commercial cleaning solution; rinse in hot water the the bracelet is complete. Final adjustments can be made to tighten or loosen the snap ends of the catch by bending the top plate or the catch end of the top plate.

With only the hinged links with letters making the name, a bracelet can be made using heavy ident chain with a sister hook for a catch. The first consideration is attaching the chain to the hinged links. At the female end of the hinged links, we saw out a bar and hard solder it to one of the end links of the ident chain. See Figure 2, View A, point a and hard solder joint point c. File it half round and fit it to the female end link; then, using the holes as a guide, drill into the male lug that was just soldered to the end of the chain. After the hole is well started, drill from the other end. When the

hole is about half-way through, change back to the first end and drill until the holes meet and the drill goes all the way through.

The other end requires a female adaptor to fit the male lug on the end of the bracelet name link. This can be done by sawing out a bar from 2mm metal stock wide enough in which to cut a slot, forming the two female lugs. See Figure 2, View A, point b. When this adaptor is made, solder it to the other end of the ident chain with hard solder. See Figure 2, View A, point d. File to a fit over the male lug of the bracelet and drill the lugs to align with the hole in the male lug. Before assembling, polish the inside surfaces; then, with .9mm brass or nickel silver wire, make the rivets and rivet the hinge joints as previously explained.

Figure 1, View A shows a sister hook closed and installed on the chain with a jump ring, and Figure 1, View B shows a sister hook unattached and open. These sister hooks can be purchased from the material distributor in almost any size needed or in any metal required to match metals used in jewelry. These can be installed by using a jump ring. The hook then attaches to another jump ring of suitable size on the other end of the chain. Once open link jump rings are attached to fine quality jewelry, it is always wise to hard solder the openings so there will be no danger of one spreading open and letting the chain fall out. When this is completely assembled, polish and clean in the same manner as when making the foldover catch.

Foldover catches can be purchased from the material jobber as can sister hooks, but they are simply manufactured catches, stamped from thin metal, and in no way compare with the quality of a handcrafted catch.

This project is a real test of one's skill as a jeweler. If you can successfully complete it, you should be capable of handling almost any repair that may find its way to your bench.

The next article will deal with the repair of saddle silver and harness and tack ornamentations which is always in demand where people have show and parade horses. TIMES



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Figure 7

engaged at present. However, a set of large, 3-bladed vanes are poised in readiness for speed control. See Figure 7. Also, set behind the pilot dial is a large brass cam having one high crest for lifting the hour-release lever when in use. The cam is weighted to give positive action.

The clock is wound by a large crank key, the steel wire cables winding onto the time train drum. The cables are of 1/4" diameter steel wire with an inner fabric core.

The pendulum, working in conjunction with a spring-loaded crutch, is made of cast iron, is 7 inches in diameter, and weighs 40 lbs. The overall pendulum length is 68 inches from the suspension point to the base of the bob.

The dials are of cast iron set in laminated rings of well-seasoned wood and mortared into the stonework. The opaque dials are glazed into their respective frames.

General maintenance is routine and fairly simple. At the Museum of Time, the steep and narrow staircase should be negotiated with caution. However, Bob Phillip, being an old WWII sailor from the Canadian Navy, laughs at the suggestion. Inasmuch as the tower is usually clean and not open to other outside influences (birds, bats, etc.), major problems are few. General maintenance consists of lubricating all the pivots twice a year, using a good grade clock oil. The pinwheel needs to be brushed off every 6 months and the pins relubed, every 5th or 6th tooth, using a standard clock oil.

As a final reference, the name of Joyce of Whitchurch (Salop) England is marked on the pilot dial. According to Bob Phillip, the Joyce Company eventually amalgamated with the well-known Smith Clock Company of England.

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AWI and REC Annual Technical and Hands-On Workshops

Once again, from horology departments in schools across the United States and Canada, horologists gathered at the Americana Inn in Cincinnati, Ohio early this summer to attend the annual technical and hands-on workshops of the AWI Research and Education Council. As usual, the purpose was to upgrade and update instructors on current developments in the horological profession. The gathering began June 21, lasted through the 25th, and was attended by the following horologists representing the various member schools:

Daniel Benson, George Brown College, Toronto, Ontario, Canada; Jim Broughton, AWI Instructor, Columbus, Ohio; Alice Carpenter, Wayne Community College, Goldsboro, North Carolina; Michael Cosby, George Brown College, Toronto, Ontario, Canada; Gerald R. Hough, Parkland College, Champaign, Illinois; George Hoyt, Daytona Beach Community College, Daytona Beach, Florida; Thomas H. Imai, Spokane Community College, Spokane, Washington; Gerald G. Jaeger, Milwaukee Area Tech. College, Milwaukee, Wisconsin; Deane L. Jenne, Nashville Vocational Tech., Nashville, Tennessee; Elmer S. Leighton, Kilgore College, Kilgore, Texas; George T. Lewis, North Seattle Community College, Seattle, Washington; Anthony Lorenzo, Bulova School, Woodside, New York; Leon Martin, Orangeburg-Calhoun Technical College, Orangeburg, South Carolina; Charles R. Miller, Chamberlain Vocational Tech., Washington, D.C.; Robert L. Nowell, Paris Jr. College, Paris, Texas; Archie B. Perkins, Emily Griffith Opportunity School, Denver, Colorado; Joseph Rugole, George Brown College, Toronto, Ontario, Canada; George Schlehr, Mountain View College, Dallas, Texas; Murray Schwenger, George Brown College, Toronto, Ontario, Canada; Robert J. Sener, Bowman Technical School, Lancaster, Pennsylvania; William O. Smith, Jr., Parkland College, Champaign, Illinois; Frank Torre, North Bennet Street Industrial School, Boston, Massachusetts; Howard Woodward, St. Paul Vocational Tech., St. Paul, Minnesota.

The principle topic for the week, "New Developments in the Science of Time and Time Measurement," was

broken into three phases:

1. Engineering design for new products.
2. Quality control in manufacture.
3. Human inspection in final assembly.

Over the five days of lectures and demonstrations, the horologists got a chance to compare notes on various instruction techniques, work with models of watches not yet available commercially, and have questions answered and problems ironed out.

On Monday, June 22, the Bulova Watch Factory, represented by Leo Helmprecht, Technical Manager, and Henry Frystak, Senior Instructor, presented Quartz Certification Workshops for the following models: 262, 263, 245, and 250. All participants received both their certification and a graduation present of a Bulova clock.

On the morning of Tuesday, June 23, instructor Archie Perkins from Emily Griffith Opportunity School in Denver, Colorado, gave a demonstration on gear cutting. In the afternoon, Bill Smith, Jr., instructor from Parkland College, Champaign, Illinois, gave a seminar in escapement and hairspring manipulation. And finally, that evening, all were invited to the Cas-Ker Material House for a tour of the two-floor facility. It was interesting to see this kind of operation so as to be able to pass on the information to students. Our thanks go out to Mr. Cassidy and his valiant crew.

Wednesday, June 24 began with Eric Lorenz, Manager of the Consumer Division of Rolex Watch Company, presenting the film, "Of Time and Men," and showing the new Rolex models. This marked the first appearance of Rolex at an annual REC seminar, and we hope to have them return as their information was very useful and interesting.

That afternoon, the REC held its business meeting and election of new officers. Those elected for 1981-82 are as follows: Chairman, Thomas Imai, Spokane Community College, Spokane, Washington; Vice-Chairman, George Lewis of North Seattle Community College, Seattle, Washington; Secretary, Robert Sener, Bowman Technical School, Lancaster, Pennsylvania; Director, Archie

Perkins, Emily Griffith Opportunity School, Denver, Colorado; Director, Gray Lawrence, Oklahoma State University of Technical Training, Okmulgee, Oklahoma.

On Thursday morning, June 25, the Watchmakers of Switzerland, represented by Vice-President Francois Girardet, once again put on a very fine program. First, a technical film on new models of watches was presented, followed by a detailed diagram of the Swiss manufacturing industry. It was most pleasant, as we could understand the complex arrangement from the top of the industry to all the various branches.

In the afternoon, Seiko Watch Company, represented by Jack Schechter, Technical Manager, and Scott Chou, Associate Manager of the Technical Department, gave a very interesting seminar on "logic circuits," step motor construction and cell voltage. Seiko has put on many seminars for the benefit of the watchmaker/instructors as well as appearing for the REC workshops.

As instructors, we felt very enlightened by these technical seminars and could envision what the future holds for the role of electronics in the watchmaking field.

We wish at this time to thank those of you who attended the REC meeting; we hope that you have received some benefits and guidelines for your curriculum. For those of you who might have been new this year, we extend a hearty welcome and invite you to "climb aboard" for this year's journey into 1982. Stay with us as we explore the frontiers of the mechanical, the electronic, the automatic, the LED, the analog and the digital. The five officers elected at this meeting will be piloting you through the rest of this year, until July of 1982. In order for this REC spacecraft to make a successful journey, we will need all the backup help we can get from member schools. Our computers are ready and waiting, so please send us some input for our "space program," and as the chairman, I will see that all your information is used wisely. I will also see that you have a ringside seat on our ship and insure that you have a wonderful time foreseeing the future of horology.

Archie Perkins Honored as Vocational Educator of the Year



Archie Perkins was honored as Vocational Educator of the Year by the Vocational Teachers Federation of Denver, Local 203, at a cocktail-dinner party held May 2, 1981 in Denver, Colorado. Joan Gehle, President of Local 203, presented the award before an audience of 65 area vocational instructors. Mr. Perkins is instructor of horology at the Emily Griffith Opportunity School in Denver.

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Plight of the Young Watchmaker

A few weeks ago, I wrote an article for our association newsletter in which I lamented the fact that too few young people were learning watch repair as a profession. I surmised that perhaps the financial returns were not high enough. For the very first time, someone took a little of their precious time and sent a reply. It also made me feel good to realize that at least one person was reading my column.

I would like to pass on to you some of the thoughts which this young man expressed. They may give us some insight into what we can do to get more young people to enter our profession. I will not quote his letter verbatim, but I will give you the general text of the letter:

I received the latest WAO Newsletter last week and felt that I had to pull out my pen and drop you a line. Referring to financial instabilities, it was stated that fewer young men are finding this to be a lucrative profession. The statement is true, and being one of those young men, I would like to bring out a few points, especially since the Horological Times recently mentioned the same thing.

Most of you guys talk as if you attained your present level of affluence by slaving away all day in a store or trade shop and then coming home and working until the wee hours of the morning. These do not sound like great hours to me. Most of the watchmakers left (self-employed, at least) have already made their fortunes and now do not need to make much to live on. In fact, some of them do not even know whether or not they are making a profit! Compare



Robert Allis

this to a young man just starting out who needs \$5,000 (approximately) for tools, a decent house for his family to live in, and perhaps a car that will not break down every week—and this at today's interest rates. Think of the prices you paid when you were starting out in contrast to making \$1,000 a month just in loan payments, and you will realize why we need more money. However, if we mention raising prices, we are accused of trying to gouge the customer.

Of all the people who studied watch repair at the Cuyahoga Community College (class now defunct for lack of interest), I know of only one other person who is now actively engaged in watch repair—certainly not a good percentage. I read about union laborers making ridiculously high wages for unskilled work, but the highly skilled

watchmaker receives a fraction of such wages for his work. I don't know if you can come up with any of the answers for this, but if you can, it will be a big help to all of us.

He goes on to mention other things in his letter, but the above is the important part. Please don't think that he is a griper or "sour apples." I know the man personally and I can assure you that he will make it. He has all the attributes necessary to be a successful trade shop operator, but how about the others? Will they persevere or will they find it easier to go to work in some factory at \$250 per week with no experience necessary? In fact, you don't even have to work.

I can assure you that I do not know the answers, but I feel that the associations, through an exchange of ideas, can come up with a few of the answers. Let's get our collective heads together on this one. Bring it up at your meetings and in your conversations with other watchmakers. We need an infusion of youth into our profession. About five years ago, a survey was made in the state of Ohio, and it was determined that at that time the average age of the watchmakers in the state was 55 years. As I say, that was 5 years ago, and "they ain't none of us that has grown any younger." If you have any ideas on this or any other matter in which we as associations can be of any help to the watch repair profession, please send me a letter so that we can all kick it around a bit. This is the way in which the guilds and associations can be of help to each other and to all watchmakers.

"Of all the people who studied watch repair at the Cuyahoga Community College (class now defunct for lack of interest), I know of only one other person who is now actively engaged in watch repair—certainly not a good percentage."



OHIO CONVENTION

OHIO

Another successful and informative Watchmakers Association of Ohio Convention has come and gone. The event was attended by 120 WAO members and their wives who registered Friday, July 24, at the Marriott Inn East, Columbus, Ohio.

Five states other than Ohio were represented: George and Dottie Cordes from Lake Okeechobee, Florida; Bob Moengen, Minnesota; Estle and Edith Bailey, Greenup, Kentucky; Pat Monk and Charlie and Dori Barnes, Michigan.

Material house displays by E. & J. Swigart, Portescap U.S., Toledo Jewelers, A. G. Bartholomew, Inc., Colmans-Borel, and Jewelmont were of interest to everyone throughout Friday afternoon and Saturday. Refreshments in the display room were compliments of the above displayers.

Friday night, everyone participated in "A Nite (sic) at the Trotters" with refreshments and snacks compliments of Stern, Inc. and William Werkhaven & Son.

On Saturday, members attended presentations by Bob Swensgard of Portescap U.S., Bob Moengen of Jewelmont, and, after lunch, a presentation by Jack Schecter of Seiko Time Corporation entitled "Servicing the Exterior of a Seiko" and "In Search of Precision."

While the gentlemen were busy learning about their profession, the ladies were enjoying a tour of the new Ohio

Center and a leisurely Saturday lunch.

At the meeting of the WAO Saturday afternoon, the following directors were elected: Robert Allis, Al Brehl, Ralph Giantonio, Anthony Basch, and Estle Bailey. Officers elected were: President, Al Brehl; Vice-President, Wilbur Ludwig; Treasurer, Elmer Hilvers; Secretary, Howard Opp; Executive Secretary, Al Gruenig.

The Saturday night banquet was attended by 111 members and guests. Approximately 75 gifts were won by those in attendance, plus several gifts won in the display room. Following the banquet, everyone enjoyed the President's Ball with open bar compliments of A. G. Bartholomew, Colmans-Borel, Jewelmont, Portescap, and Toledo Jewelers.

During the Saturday night banquet, retiring WAO President Bob Allis presented President-elect Al Brehl with the President's gavel to use during his term of office. Al Brehl, in turn, presented Bob with his own new gavel, a WAO Past President lapel pin, and a very beautiful Bulova desk clock which was given to WAO by Arnold Berger and his fellow Bulova salesmen.

CALIFORNIA

The Central California Watchmakers

Guild held a meeting on July 28, 1981 in Fresno, California.

The Executive Board arranged an interesting program for both watchmakers and jewelers. It was presented by Al Gilbertson, a gemologist and member of the American Gem Society.

The CCWG is formulating plans for a get-together in the near future with the Bay Area Watchmakers Guild.

IOWA

The Iowa Jewelers and Watchmakers Association is planning its Convention and Trade Show for September 12 and 13, 1981. It will be held at the Best Western Airport Inn in Des Moines, Iowa.

There will be many interesting exhibits, prizes to be won, and delicious meals to be enjoyed.

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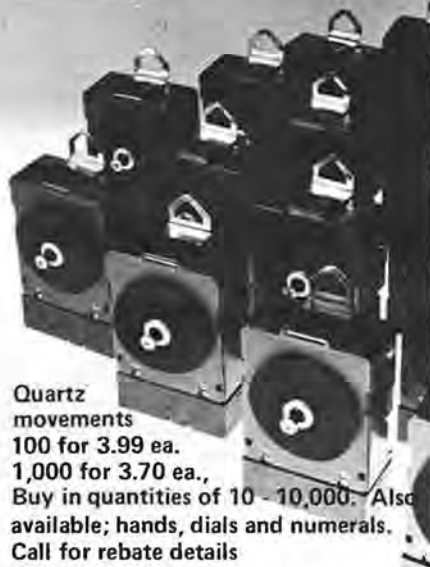
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TECHNICALLY WATCHES
(Continued from page 11)

by C & E Marshall Company has approximately the same specifications except the bed is 12 inches long. The Peerless lathe by C & E Marshall Company is copied after the Mosely lathe.

SPLIT WIRE CHUCKS

One of the most delicate and most abused attachments to the watchmakers lathe is the split wire chuck. The split chuck must be made from the finest tool steel to the most exacting standards; otherwise it is of no use to the watchmaker. A split chuck must be hardened and tempered correctly in order for it to have the proper spring action when chucking and releasing the work being chucked. If the chuck is too soft, the jaws will become set or deformed when it is used. If the jaws are too hard, they may become broken when the chuck is used. If the chuck is not uniformly hardened and tempered, one jaw may be deformed when the chuck is used, making it impossible to make the work run true. Other problems appear with split chucks if they are not made uniformly. For example, if the relief hole in the back of the chuck is off center, the jaws of the chuck will not spring evenly which could cause the work to run out of true, or if the jaws are split unevenly, they will not



Figure 5

close evenly when the chuck is being used. Another point, and the most important, is that the hole in the chuck which holds the work must be drilled in the center of the chuck and run true. The hole in the chuck should be ground true and to size after the chuck has been hardened and tempered. Standard accuracy for the hole is usually .0002 inch. Sometimes chucks are supplied where the hole is ground to a special accuracy of .0001 inch. This makes them cost more per chuck, but it is well worth the price when special accuracy is needed.

Figure 6, View A shows a piece of material that is inserted into the hole of a chuck which is the correct size. The material should go into the hole freely without causing the hole to be forced open wider, but the material should not fall out of the chuck if it is held by its thread with the material

pointing downward. When the chuck fits the material correctly, the slots in the chuck will remain parallel, as in View B, Figure 6, when the chuck is tightened on the material.

Chucks can easily become damaged if used carelessly or used improperly. If a piece of material that is too large for the hole in the chuck is forced into the hole, the jaws of the chuck will be sprung, as in Figure 7, View B. Then when the chuck is tightened on the material, the chuck will be permanently damaged so it will never run true again. On the other hand, if the hole in the chuck is too large for the work being chucked, when it is tightened up on the work, the jaws are likely to take a permanent set which will make the chuck useless. This is shown in Figure 8, View B. When the work is too large for the hole in the chuck and the work is forced into the chuck, only the back end of the hole contacts the work, and it is impossible to make the work run true without wobbling in the chuck. This is shown in Figure 7, View A. If the work is too small for the hole in the chuck, when the chuck is tightened on the work, the outside end of the hole contacts the work which would allow it to wobble in the chuck. This is shown in Figure 8, View A. Not only should the work fit the chuck correctly, but the bearing angle on the chuck must be kept clean as well as the

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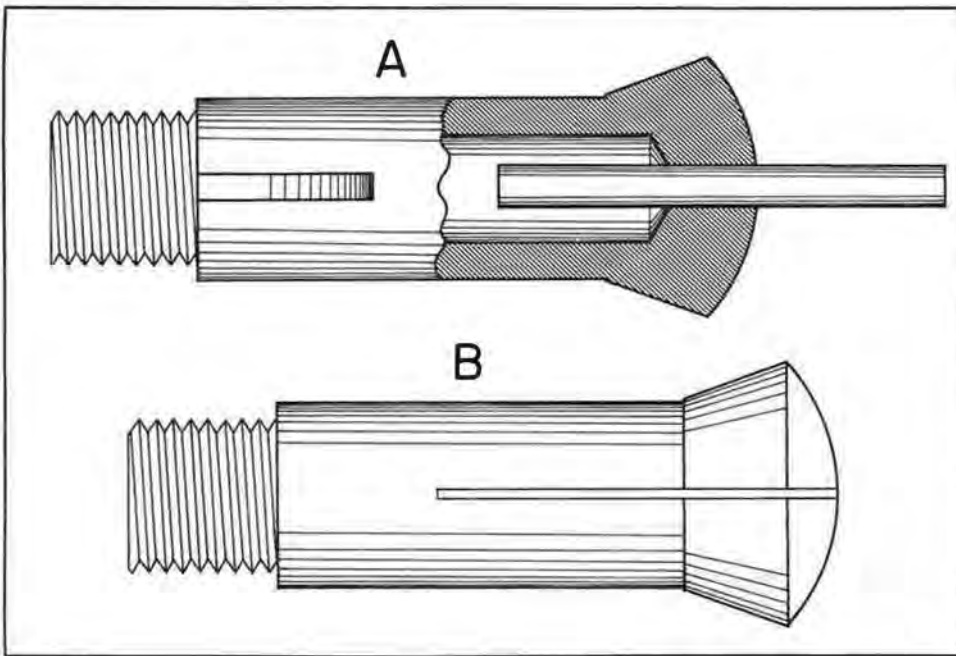


Figure 6

matching angle in the spindle of the lathe where the chuck is seated. When a chuck has been sprung inward or outward, the angle on the chuck no longer matches the angle in the lathe spindle. Therefore, the proper action between the angle on the chuck and the angle in the spindle cannot take place. This prevents the chuck from running true.

Figure 9 shows the end of a lathe spindle and how the chuck can be seated into it. View A shows the lathe spindle; View B shows the chuck and how it fits into the spindle; View C shows the draw-in spindle; and View D shows the key that is fastened in the spindle which works in the key way of the chuck to prevent its turning when the draw-in spindle is tightened on the chuck to close it.

Much damage is done to chucks when the worker runs the graver or cutter into the face of the chuck or gets the corner of the "T" of the hand rest caught in a slot of the chuck when

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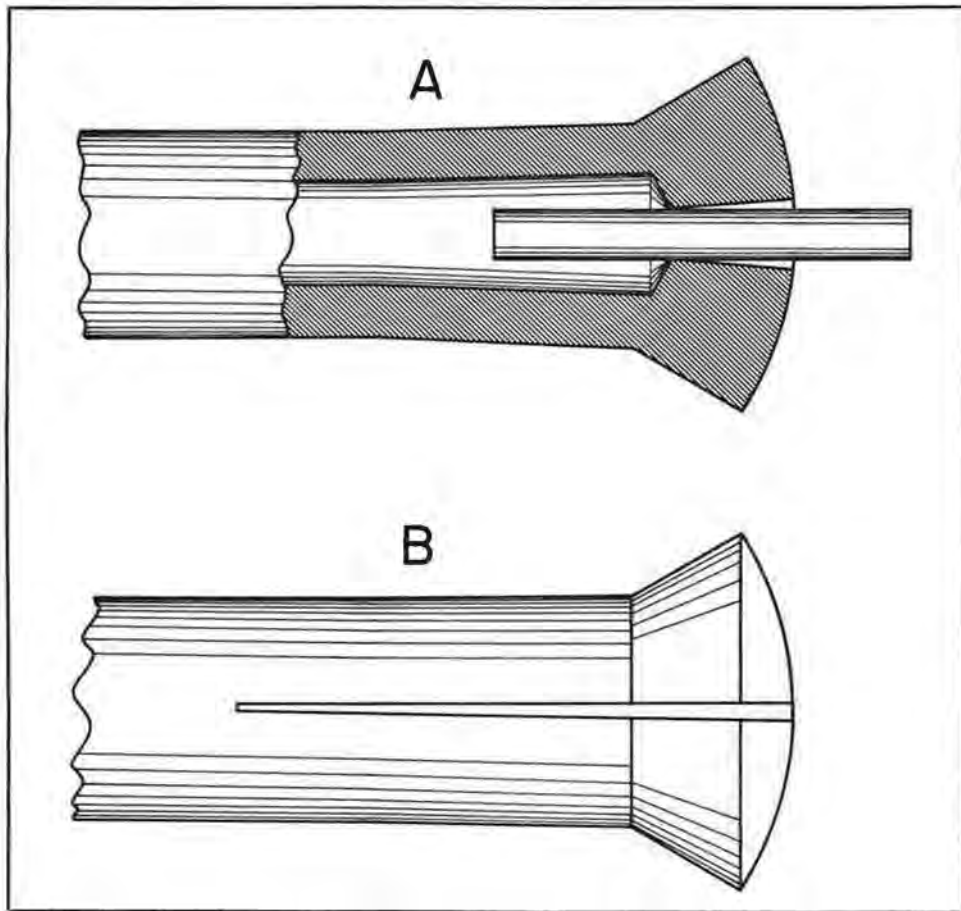


Figure 7

the chuck is being released from the work. The chuck must never be tightened when there is no work in it. This causes the jaws to be closed to the extent that they become permanently deformed, and this makes the chuck useless. Chucks should not be closed on material more than 1/4 size smaller than the hole in the chuck. When a chuck is tightened up on the work, it should take very little effort to secure the work in the chuck. If it takes much effort to secure the work in the chuck, then the hole in the chuck is too large for the work.

The hole sizes in chucks are usually gauged by the metric system, although some companies can supply chucks in drill sizes or in thousandths of an inch. When the metric system is used, the hole sizes in the chucks are graduated in .1mm increments. For example, the Number 1 chuck has a hole that is .1mm in diameter; a Number 2 chuck measures .2mm; a Number 10 chuck measures 1.0mm; and a Number 40 chuck measures 4.0mm. Chucks come in sizes of 1 through 80, and in half sizes from 1 to 10. To select a chuck for a given piece of material, first measure the part of the material that is to be chucked up with a metric micrometer. If that part of the material measures 1.30mm, then the correct chuck should be a Number 13. If the material will not enter the hole in the chuck, then the next

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size larger chuck must be used.

The holes in chucks vary with the different makers and also vary with the same maker. In other words, all number 10 chucks may not measure exactly the same in the holes.

When buying a set of chucks, the ones selected and how many selected varies with the needs of the watchmaker or clockmaker. A watchmaker who repairs all sizes of watches needs every size of chuck from 1 through 20 with half sizes from 1 to 10, as well as numbers, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 48, 50, 60, and 64. The clockmaker usually doesn't need all of the small sizes, but needs more of the larger sizes. For example, the clockmaker can start at Number 10 and buy all sizes from 10 to 20, every other size up to 50, and then a 60, 64, 68, 72, 76, and 80.

The storage of chucks is an important factor for the watch and clockmaker. They should not be thrown in a drawer for two reasons: when they bump together, they could be damaged, and also, trying to find a chuck of the proper size is too time-consuming. Buying a standard chuck box in which to store the chucks is recommended, or a board can be made to fit into the drawer of the bench. Lay out lines on the board, 3/4 inch apart at right angles so the lines cross at 3/4 inch intervals. Use an 11/32 inch drill in a drill press to drill holes

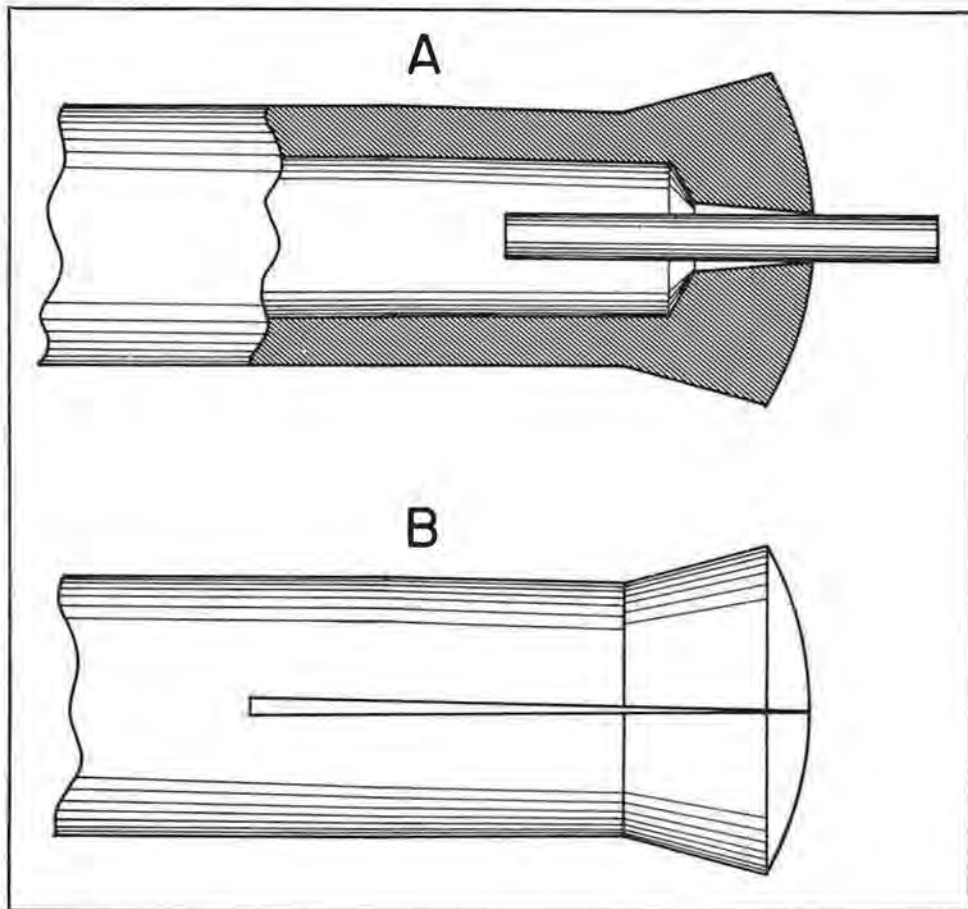


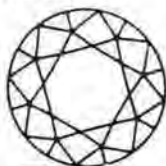
Figure B

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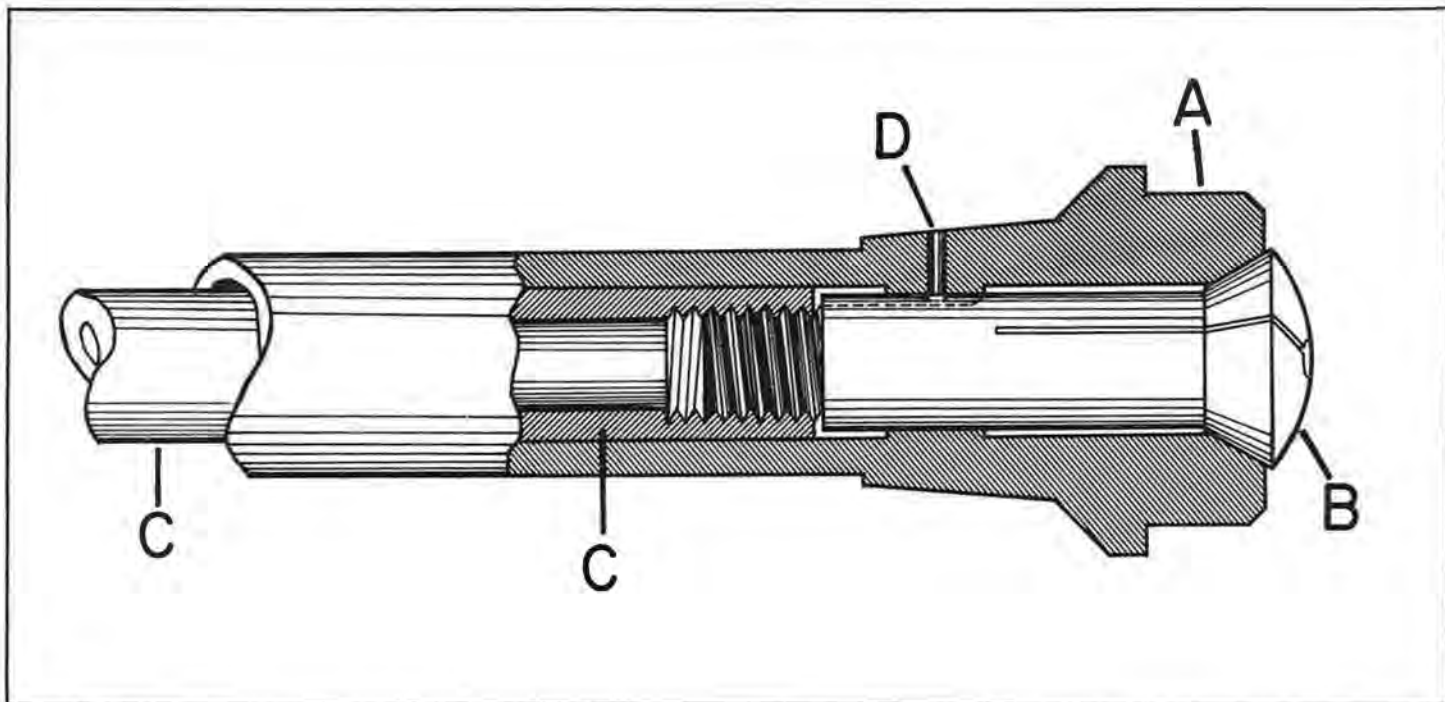


Figure 9

where the layout lines on the board cross each other. The chucks should be placed in the board starting with the smaller sizes at the front of the drawer in such a manner that the sizes should increase from left to right in each row.

This makes it easy to select a chuck. Another idea for storing chucks is to use nails or wood pegs in the board for the chucks to fit over instead of drilling holes for the chucks to fit into. It is recommended that the watch or clockmaker

buy chucks of the highest grade that he can afford.

More on the modern watchmakers lathe will appear next month.

T.M.B.

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The Other Side of the Tick-Tock Clock

This rebuttal to balancing "dog leg" crutches on 31-day clocks ("Bench Tips," Horological Times, April, 1981) is from Mr. R. Geddes, 1686 Washington St., Boston, MA 02118.

With reference to your April "Bench Tips" column, a very popular misunderstanding about out-of-balance crutches seems to be afoot. I submit this argument:

It makes no difference whether the crutch leans always on one side or pushes alternately on each side of the pendulum rod. The force of the escapement, when transmitted through an out-of-balance crutch, is, in effect, added and subtracted alternately from the weight of the leaning crutch on the pendulum rod. Therefore, the power delivered is the same.

In fact, I have seen a number of high-grade regulators with one-sided crutches, i.e., a single bar held firmly against the pendulum rod, in one direction only, by a small weighted arm extending horizontally from the pallet arbor. The advantage is that factors normally associated with crutch freedom on the rod are eliminated, and that part of the impulse which would have been wasted at every beat is now used.

Therefore, you needn't bother yourself about an out-of-balance crutch.

O.K., Mr. Broski and Mr. Geddes. Both of you fellows seem to have a valid point. To keep the record straight, I will add

that it is apparently assumed you are referring to recoil clock escapements.

Although I may disagree with both of you, I will defend your right to disagree. Why don't you two correspond and send me a copy? Then again, it has long been known about the way I think: there is the right way, the wrong way, and Joe's way.

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PRESIDENT'S MESSAGE
(Continued from page 4)

there was a 14% increase, and another 9% increase occurred after the 1979-80 "oil shock." Need I say more?

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tion break, but don't count on it.) Even if your income stays the same as last year, you will still pay more federal tax, more tax on dividends, more for Social Security, and more for cigarettes, gas, and the booze you will need next April 15th to deaden the pain. The new tax cut will just counter the increases already programmed into the economy.

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CASEDY, John, Cas-Ker Co., Cincinnati, OH: Intertime Corp. Quartz Timer, Serial No. 0057.

CHRISTIANSON, R. W. & David A., Kendallville, IN: Framed advertising lithograph of Gruen Watch Co.'s "Time Hill" factory, Cincinnati, Ohio, ca. 1920.

CROOKS, Joe, Mooresville, NC: Swiss watch movt., Lepine calibre, lever esc., gold engraved dial, applied Roman Hr. numerals, ca. 1860. German WWII fighter plane clock, black dial, luminous markers & hands.

GRUNDE, Maurie, St. Paul, MN: Gents' wrist
(Continued on page 56)

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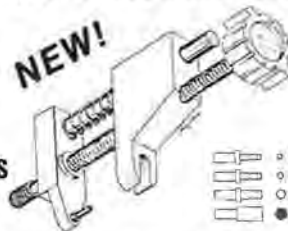
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(Continued from page 23)

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Figure 4

REMOVING THE PRESS-FITTED BUTTON FROM THE CASE:

The ability to remove and repair faulty buttons is advantageous because exact replacements are not always available.

Since most faulty buttons are caused by dirt and grime buildup in the moving portion of the button (See



Figure 5



Figure 6, A



Figure 6, B

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Figure 6, A), it is important to remove the button from the case in order to clean it properly. See Figure 6, B. Because exact replacement buttons are not always available, it is important not to damage the button when removing it.

Henry B. Fried and Louis A. Zaroni have designed and developed a unique button remover and adjustment tool known as the Zantech-Fried Button Press, Model 440. See Figure 7. In next month's issue, we will describe the procedure required to successfully remove and insert buttons using this tool. The same basic principles could also apply to other types of button-removal tools.

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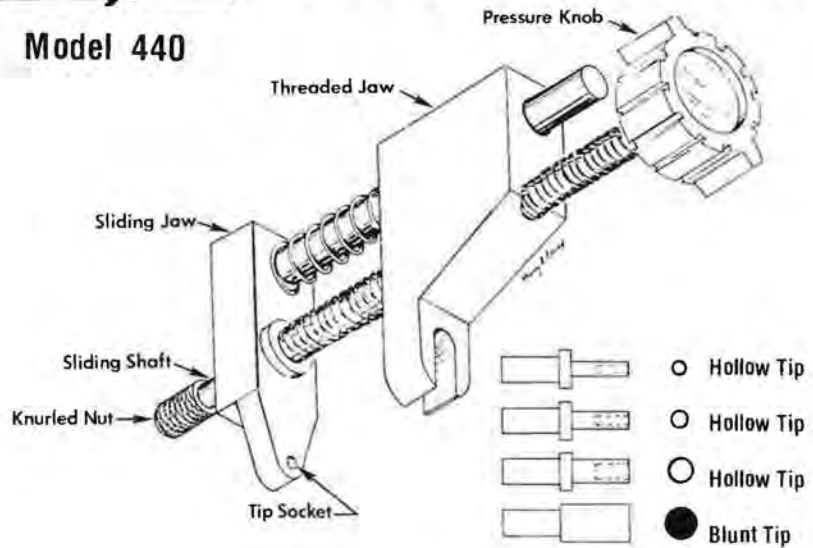


Figure 7



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HAGEN, Ralph, Casper, WY: Brass advertising item with samples of 3 steps in cutting wheels for watch movements, distributed by Waltham Watch Co. at the Panama-Pacific Exposition, San Francisco, 1915.

HERMLE, Franz & Sohn, Gosheim/Wittbg., West Germany: 8-day Westminster chime movement No. 451-053 K 2, fitted with calendar mechanism, moon phase dial, hands, pendulum and wpts. Mounted on handmade oak backboard. Quartz chiming movement, (Bim-Bam, Westminster, Whittington & Ave Maria) with 11-inch brass pendulum, Model No. 1217.

HIJAB, Shukry A., La Vale, MD: LCD digital watch movement and LCD digital solar watch movement. SunDial Co., La Vale, MD.

HOKE, Mrs. Terri L., Poulsbo, WA: Portable gold scales, plug weights up to 2 oz, Troy. In original wood box, ca. 1896.

HOKE, Mr. Wayne N., Poulsbo, WA: Illinois

"Bunn Special" r.r. p/w, 16s, 21j, lever set, No. 4284976, o/f swing ring g.f. case, ca. 1918-19. Illinois "Bunn Special" r.r. p/w, 16s, 21j, lever set, No. 3611271, g.f. case, o/f, screw back & bezel, ca. 1909-10. Illinois "Santa Fe Special" r.r. p/w, 16s, 21j, No. 3829781, engraved nickel o/f case, screw back & bezel. Illinois p/w, 18s, 17j, full plate, lever set, g.f., h/c, ca. 1892-93. Elgin "G. M. Wheeler" p/w, 18s, 15j, key wind/set, No. 573206, coin silver h/c, ca. 1878. Rockford p/w, 16s, 15j, lever set, No. 364892, Fahy's ore silver o/f case, screw back & bezel. Rockford p/w, 16s, 15j, lever set, No. 361843, red gold h/c, ca. 1898. South Bend p/w, 16s, 17j, lever set, No. 421252, white metal o/f case, screw back & bezel, ca. 1908. Seth Thomas p/w, 16s, 17j, stem wind/set, No. 2512969, red gold o/f case, ca. 1912. Montgomery Ward "20th Century" p/w, S. T. movt. No. 703278, 16s, lever set, swing ring nickel case, ca. 1903. Jean Cordot p/w (fake r.r.), 16s, 17j, lever set Russian movt., locomotive on dial and back cover o/f nickel case. Jaeger portable tachometer, Geo. Scherr Co., NY., 100 revs, 500 feet, two drive shaft attachments, orig box. Hamilton Chronometer, Model 22, 21j, No. 2F12123, U.S. Navy-Bureau Ships, 1942. Elgin Aircraft clock, luminous dial & hands, No. HAF43-2742, black case, Waltham car clock, 7j movt., No. 20908683, base metal case. Elgin Watch Co., Micronics Div., Lapsed time indicator ser. No. 950, Model 95-1000S. Lot of 30 old watch dials, plain & fancy enamels, American, English & Swiss. Standard large wheel gauge, 3 thru 23, Ané Mon Guerre Ferret Succr, engraved name J. M. & John Bigwood. Footed sq. brass pivot gauge, Swartchild & Co. Hampden p/w, 18s, 17j, No. 1607229, lever set, base metal

o/f case, ca. 1892-93. Hampden p/w, 16s, 17j, No. 3222953, stem wind/set, nickel o/f, swing ring case, ca. 1909. Hampden "Wm. McKinley" p/w, 16s, 17j, No. 3127394, stem wind/set, o/f base metal case, ca. 1908. Waltham p/w, 12s, 15j, No. 19215199, stem wind/set, o/f Deuber case, ca. 1913. Waltham "Premier Colonial" p/w, 12s, 17j, No. 30711401, stem wind/set, o/f Keystone g.f. case, ca. 1941. Waltham-Appleton Tracy & Co., 18s, 15j, lever set, h/c movt. No. 1139226, o/f silveroid case, ca. 1977. Waltham-AWW Co. p/w, 18s, 15j, No. 4492345, stem wind/set, o/f nickel case, ca. 1899. Waltham-AWW Co. p/w, 12s, 7j, h/c movt. No. 11982246, white o/f case, ca. 1902. Hamilton p/w, 16s, 17j, No. 358148, o/f Fahys g.f. swing ring case, ca. 1904. Hamilton p/w, 16s, 17j, No. 890330, o/f g.f. swing ring case, ca. 1907. Hamilton p/w, 16s, 17j, No. 1029349, o/f nickel case, ca. 1909. Hamilton p/w, 16s, 17j, 56418, o/f silveroid case, ca. 1900. Elgin p/w, 18s, 15j, h/c movt. No. 1368325, o/f g.f. swing ring case, ca. 1882. Elgin p/w, 16s, 15j, No. 25311401, silveroid skeleton case, ca. 1922. Elgin p/w, 1/12s, 7j, h/c movt. No. 9467228, o/f Gilbralter case, ca. 1901. Elgin p/w, 18s, 17j, No. 15420268, p/f silveroid case, ca. 1910. Elgin p/w, 18s, 15j, No. 16831022, o/f Defiance base metal case, ca. 1911. New York Standard "Columbia" p/w, 6s, 7j, lever, set, No. 5759075, Premier g.f. h/c. New York Standard pocket watch, 3/0-10s, lever set, No. 7239502, red g.p. h/c case. Burlington p/w, 12s, 21j, No. 4667811, o/f white g.f. case. Ingersoll "ensign" p/w, 16s, No. 9146611, metal case, ca. 1939.

(Continued next month)

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This book is the most significant work on clock repair to be published in this century! The authors, Joseph G. Baier, PhD, CMW; James L. Tigner, CMC; and Marvin E. Whitney, CMW, CMC, are recognized as being among the leading contemporary horologists in the field.

They follow the same format as was used in AWI's popular "Questions and Answers of and for the Watchmaking Profession," which was published in 1970. The original Q & A book has been widely used by students and schools of horology. It is about to go into its third printing. The new "Clock Q & A" book will be a companion to the earlier text.

The book contains 224 large, 8½ x 11 in. pages and includes many original drawings and photographs. The economical but durable soft cover helps keep the volume in a price range easily affordable by students and beginners as well as professionals.

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JEWELERS PROFIT FROM IN-HOUSE REPAIR

Jewelry store owners who can do their own watch and jewelry repairs stand to make much bigger profits than those who have to farm out such work, according to an article in a recent issue of "In Business" magazine.

Repairs are "the traffic and money-making hub" of the watch business, notes the magazine in a profile of the Kansas City Watchmaking School (KCWS) and its graduates.

Watch repair is also an excellent step toward owning one's own business, the article suggests. A watchmaker working in a mom and pop jewelry store can learn the managerial end of the business and buy out the owners when they want to retire. Or he might look around for a store with declining sales and purchase the business for the cost of fixtures and inventory.

Despite the high earning potential in the watch and jewelry repair field, it is not overcrowded, notes Bob McKnight, KCSW's Associate Director. Young trainees are especially in demand. "Most young people aren't terribly thrilled over the idea of a learning process which entails sitting at a bench for hours, working tediously on small objects," he said.

The 43-year-old school enjoys a solid 98% job placement record, "In Business" reports, but at any time, from 40 to 60 jobs in the field remain unfilled.

HUMPHREY NAMED MARKETING MANAGER FOR GEM INSTRUMENTS

David A. Humphrey, G.G., has been named Marketing Manager for Gem Instruments Corpora-

tion, wholly owned subsidiary of GIA, according to Ken Moore, Vice-President of Sales.

Humphrey is responsible for the operations of the GEM showroom in Santa Monica, California. He represents GEM at various trade shows. Humphrey is well-known for his talks on GEM instruments and their practical, profitable applications to the jewelry industry.



SEIKO'S CONSUMER AD PUSH SHAPING UP FOR THIS FALL

Seiko announced recently that it will launch its multi-media Fall advertising campaign as a sponsor of the World Series and Monday Night NFL Football, both on the ABC-TV network. These are two of the most-watched major sports events on television. More than 66 million persons will view the Seiko prime time World Series commercials and over 38 million people will be exposed to Seiko on Monday Night Football on ABC-TV.

David Strousse, Seiko Time Corporation's vice-president of advertising and public relations, stated that Seiko has scheduled

a series of new 30-second network spots for its Seiko brand men's and ladies' analog quartz watch line and its newly introduced Seiko Lassale brand of elegant, thin, men's and ladies' watches on both of these sports events.

In print, Seiko's plans include a bigger-than-ever buy in leading consumer magazines for its gold quartz watch line and designer quartz clock collection this Fall. These 4-color ads will run in the New Yorker, Newsweek, Town and Country, Harpers Bazaar, House Beautiful, New York Times Magazine, Better Homes and Gardens, House and Garden, Southern Living, Sport, Time, Forbes, and Smithsonian, among others. To supplement this intensive magazine campaign, Seiko has scheduled a wide-ranging newspaper campaign for its analog quartz watches in 75 markets, and its gold quartz watch line and quartz clocks in 50 markets for this Fall.

"The total Fall 1981 consumer advertising program is, without any question, the biggest in Seiko's history," said Strousse.

AC&R Advertising Inc., of New York City, is the advertising agency.

L & R MANUFACTURING NAMES NEW QUALITY CONTROL MANAGER

L & R Manufacturing, a world leader in ultrasonic cleaning systems and chemicals, has recently announced that Michael Hudacko has joined their firm as Quality Control Manager. Hudacko was a Q. C. Test Laboratory Supervisor with Gulton Industries, and



prior to his appointment with L & R, was Manager of Test Engineering at Torwico Electronics, Inc., in Lakewood, New Jersey. He will be in charge of both quality control and quality assurance. Hudacko brings with him an in-depth knowledge of the Company's manufacturing procedures which include bonding, stud-welding, wave soldering, impregnating, fastening, and hand-assembly. He will also manage test equipment calibration.

MAXELL BATTERY NAMES FIELD SALES MANAGER

In a climate of increasing product demand from this electronic age, Maxell Corporation of America has appointed Keith Sessler as Battery Field Sales Manager. He will work with Mark Welland, National Sales Manager, from headquarters in Moonachie, New Jersey.

Mr. Sessler has sales experience in the battery products area, having worked previously in New York for Duracell with watch, photo, and alkaline batteries. Keith will cover the country and work with OEM accounts,



as well as Watch Battery Distributors. To date, some of his new accounts include Advance Watch, Otron International, Minolta, Bulova, and Lucien Picard.

**ROKUYA YAMAZAKI
APPOINTED PRESIDENT
OF CITIZEN WATCH, LTD.**

Citizen Watch Co., Ltd., of Tokyo, the world's third largest seller of quality quartz watches, today announced that Rokuya Yamazaki has been named president. Mr. Yamazaki succeeds Eiichi Yamada, who assumes the position of chairman of the board.

Citizen Watch Co. is the parent of a U.S. subsidiary, Citizen Watch Co. of America, Inc., headquartered in Lyndhurst, New Jersey.

Citizen Watch produced 28 million watches in 1980 and predicts 40 million units for 1981. The company, which recently celebrated its 50th Anniversary, sells watches in 150 countries worldwide.

**BJORN BORG
NEW "AMBASSADOR"
FOR MIDO WATCHES**

Bjorn Borg, the world-famous tennis champion and international top sportsman of the year, has recently signed an exclusive contract with Mido, the well-known Swiss watch factory and member of the ASUAG Group.

This collaboration extends worldwide and makes the Swedish

tennis ace the goodwill ambassador for the Swiss Mido brand.

The main event of this collaboration will be the launching of a new, exciting watch collection under the name "Mido Ocean Star No. 1" which will not only attract a great deal of attention from the watch industry, but also from the general public. This new collection represents an extension of the internationally renowned Mido Ocean Star line which became famous due to its Aquadura water resistant system. The new Ocean Star No. 1 models combine leading Swiss quartz technology with sophisticated design to set a new dimension in wrist watches. The line premiered at the New York Jewelry Show in June.

The exclusive distributor of these watches in the U.S. is the Borel Watch Company, 1008 Walnut, Kansas City, MO 64106.



**BATT-TRONIC
CELEBRATES
6TH ANNIVERSARY**

Pictured is the marketing sales and service organization of Batt-Tronic Corp., which has developed into one of America's largest watch & calculator battery distributors in just six years.

William Hillson, President of Batt-Tronic, pictured second from the right, top row, praised



the "retailer's preference" for brand name batteries like Maxell, Eveready, Renata, Bulova, Sanyo, Panasonic, Timex, and Ray-O-Vac as one of the two major ingredients in his company's success. The second major ingredient was the ability to put together a formidable organization of battery specialists to accommodate retailers' preferences. According to Hillson, "The jeweler can always expect to satisfy a customer with brand name watch and calculator batteries because they last and last."

Guest speaker at the gala 6th Anniversary celebration was Mark Welland, Sales Manager - Special Products Division of the Maxell Corporation. He is pictured third from the left, middle row. In his remarks, Welland stated, "Maxell is very proud to be associated with the Batt-Tronic organization, a growth-oriented company which thrives on providing quality products and excellent service to the retailer."

Batt-Tronic maintains toll-free telephones to assist their customers: Nationwide: 1-800-431-2828; New York State: 1-800-942-1944.

**SWEST ANNOUNCES
CALIFORNIA WORKSHOP**

Swest, Inc., a leading supplier of tools, supplies, and equipment to the jewelry industry, announced plans for its next

Jewelry Casting Workshop to be held in Los Angeles on October 17-18, 1981.

Activities for the October workshop include wax model design, spruing, investing and burnout, casting, mold making, and finishing.

Reservations are on a first-come, first-served basis. Attendance is limited to 50. For a brochure and registration form, contact Swest, Inc., 1725 Victory Blvd. Glendale, CA 91201.

**PULSAR CLAIMS
STABILIZING ROLE IN
DIGITAL MARKET**

"Consumer interest in popularly priced, high-quality LCD quartz watches has never been better," states Arthur Schwartz, President of Pulsar Time, Inc.

"Up to now," Schwartz continues, "the retail jeweler and the consumer have been confused by wide price fluctuations in digital products. Pulsar has established price stability as well as value to the digital market. As a result, Pulsar's jewelers have enjoyed a resurgence of digital business. Their confidence is there."

Pulsar, the fastest growing watch brand in the history of the U.S. watch industry, sold more than 1,000,000 units in 1980, only its second year in operation. Fifteen per cent of sales were brought in by LCD watches.

TIMES

VIGOR INTRODUCES "PROFESSIONAL" NEEDLE FILES

For the economy-minded watchmaker, jeweler, hobbyist, and anyone involved in industries requiring fine precision cutting, these new files will be most welcome. The quality of these files has been tested by experienced mechanics over a long period of time and found to be highly acceptable.

This new complete line of 12 numbers (styles) in cuts of fine, medium, and coarse, are individually enveloped for protection and clear identification—and will retail for only \$.79 per file. Included are sets of 12, which retail at \$6.95, and sets of 6 which retail at \$3.90 — all in plastic pouches.

The complete selection is available with an attractive metal display stand, fully illustrated for quick and easy selection — and increased sales of needle files.

The Vigor Line of Economy Jewelers Needle Files is sold through all wholesale distributors of jewelry and lapidary supplies. The line is distributed by B. Jadow and Sons, Inc., 53 West 23rd St., New York, NY 10010.

NEW PHOTOSCOPE FROM GEM INSTRUMENTS

The new patented PhotoScope from GEM Instruments Corp. lets you take photos of gems and jewelry under magnification through the Mark V Gemolite optical system. Photos are ready for viewing in seconds. The PhotoScope adds a valuable new capability to your Mark V Gemolite, Diamond Grader, and Diamondscope.



This instrument produces excellent quality photomicrographs, often superior to pictures taken by other, more costly, photo systems. The photos can be

used to record, identify, and show inclusions and qualities present in gems. PhotoScope offers unlimited gem merchandising. The PhotoScope is ideal for training store personnel in gem examination procedures.

For more information, contact Gem Instruments Corporation, P.O. Box 2147, Santa Monica, CA 90406. Telephone: 213-829-5491.

NEW SEIKO QUARTZ PERSONAL TIME CONTROL CENTER

This Seiko men's Personal Time Control Center watch, combining the traditional good looks of an analog watch with the extra features of a digital, was one of

three new Personal Time Control Center watches introduced by Seiko Time Corporation at the Jewelers of America Show in July.

Traditional analog and digital readout are provided on this model (HX Series) for a simultaneous display of time in any two time zones plus a third time zone at the touch of a button in the digital mode! It has an alarm plus hourly time signal, chronograph split second timing, day/date, 12 or 24 hour digital modes, AM/PM and battery life indicators. It also has Seiko's exclusive Hardlex mar-resist crystal, handsome gold-tone case and bracelet, gilt dial, luminous hands and markers and is water-resistant. The other two models have a variety of strap and dial options. For further information, write to Seiko Time Corporation, 640 Fifth Ave., New York, NY 10019.



PORTESCAP ANNOUNCES RING-CRAFT FOR SIZING WEDDING RINGS

In announcing Portescap's new Ring-Craft system for sizing wedding rings, Joe Presti, general manager of the Vibrograf Machine Division of Portescap U.S. referred to it as "the answer to jewelers' requests for a system that can easily remove the trial and error long associated with sizing wedding rings."

Ring-Craft is a precision engineered system for sizing wedding rings up or down. Ring-Craft is manually controlled and uses hydraulic leverage pressure applied with precision steel dies and enlarging sleeves for exact sizing of rings without gem settings. Ring-Craft is safe and easy to use and will not mar ring surfaces.

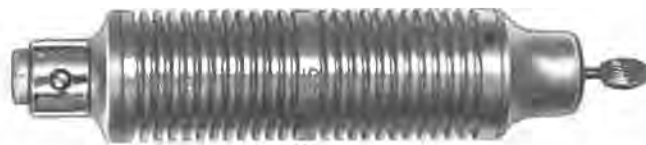
Presti also noted that "The Ring-Craft's wide sizing capability will help jewelers reduce their ring inventory."

Ring-Craft is simple to operate and sets-up in minutes. Anyone can operate it, as no trained skills are required. It comes with a one-year guarantee.

Portescap may be contacted at 6 Ohio Drive, Lake Success, NY 11042. Free, in-store demonstrations of the Ring-Craft are offered.



Portescap's new Ring-Craft system



Foredom's No. 35 handpiece

Bulova Quartz Service Manual



FOREDOM PRECISION HANDPIECE INCREASES SPEED OF TOOLS

A specially designed handpiece boosts working speeds of Foredom miniature power tools to 35,000 rpm from an input speed of 14,000 rpm. This No. 35 handpiece, manufactured by The Foredom Electric Company, incorporates an integral speed-increasing planetary drive. Holding small carbide and diamond cutting tools and abrasives, the handpiece attains the high speeds necessary for delicate and intricate metal-working on parts made of tool steel, high-carbon steel, and also

titanium alloys.

Foredom Electric Company of Bethel, CT (06801) is a division of Blackstone Industries.

BULOVA PUBLISHES QUARTZ SERVICE MANUAL

Continuing its policy of updating the watchmaker in the field, the Bulova Watch Company has just published a new "General Service Manual" for analog quartz watches.

Since most stepping motor quartz movements, regardless of brand, are similar in design, the illustrated manual is useful to any watchmaker. In order to demonstrate the relatively simple service procedures, the manual covers basic theory, compares the SMQ movement to a mechanical movement, describes test procedures, and includes helpful hints.

Bulova has sent the manual to its accounts, to all Certified Accutron Technicians, to watchmaking schools, and to AWI. The manual may be obtained by writing to "New General Service Manual," Bulova Watch Company, Inc., Bulova Park, Flushing, NY 11370.

PJC INSTRUCTORS WRITE TEXTBOOK

Everything about gemstones—the countries where they are found, varieties, history, color, hardness, and chemical composition—can be found in "Gemology for the Jeweler." This text, co-authored by Paris Junior College gemology instructors Orlando Paddock and Malcolm Heuser, has recently been printed at the college and copyrighted by the PJC gemology department.

For more information on the textbook, contact Paul Clayton, Chairman of the Horology and Jewelry Technology Division, Paris Junior College, Paris, TX 75460.



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Superior Tweezer Resharpener. \$2.50 each, including return first class postage. Minimum of three tweezers. Advance payment required. Harvey C. Watkins, CMW, P.O. Box 1738, 1204 West Cason Street, Plant City, FL 33566.

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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 \$2.00; Tani Engineering, Box 338, Atwater, Ohio 44201. (216) 947-2268.

CLOCK WHEEL AND PINION CUTTING, repivoting, retoothing, escapement work. J.C. Van Dyke, CMW, CMC, CMBHI, 1039 Rt. 163, Oakdale, CT 06370.

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NOTICE! NEW CLASSIFIED AD RATES

Due to our rising costs, a rate increase for classified advertising has gone into effect as of September 1, 1981. The new rate is \$.40 per word, \$.50 per word in bold type. This applies to all classified ads except those presently on contract, which will be protected until their expiration dates.

Help Wanted

Immediate opening for experienced watchmaker with prestigious Chicago jewelry store. Five-day week and excellent fringe benefits. Reply to: *Horological Times*, Dept. HW 9811, P.O. Box 11011, Cincinnati, OH 45211.

Established jewelry store has immediate opening for watchmaker. Must be reliable and have experience. Willing to relocate to Florida, Mid-East coast area. Call collect 1-305-562-3349 or 305-562-7879. Ask for Mike.

WANTED: Person with some experience and knowledge of watchmaking and jewelry tools and equipment to travel the States of Michigan, Alabama, Arkansas, Georgia, Iowa, Mississippi, Missouri, North Carolina, Tennessee, Virginia, Wisconsin. Established territory. Contact: *Horological Times*, Dept. HW 9812, P.O. Box 11011, Cincinnati, OH 45211.

CLOCK REPAIR PERSON needed in fast-growing clock shop located in prime retail area of Richmond, Virginia. Salary based on prior experience. Paid accident and health insurance and major medical. Paid vacation. Outstanding growth opportunity. Contact Jo Cossaboon, The Clock Shop of Richmond, LTD., 5609 Patterson Avenue, Richmond, VA 23226. (804) 282-0331.

We are in urgent need of a **FULL TIME** Watchmaker (top level only) for our store - now located at: 6 Market St., Ellenville, NY 12428. Contact D & D Jewelers.

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COLLETS (10mm for Magnus, 8mm long & shorts—all sizes) **LATHE MOTORS - TRANSMISSIONS** for lathe & milling. **LARGE ULTRASONIC CLOCK TANK, L&R VARIMATIC** or 4 for ultrasonic - mechanical cleaning machines, large baskets. D. C. Almquist, P.O. Box 2582, Staunton, VA 24401. (703) 943-4706.

MARINE CHRONOMETERS WANTED, any condition. J. P. Connor & Co., 629 Tanglewood Lane, Devon, Pennsylvania 19333.

IMMEDIATE CASH PAID for American/European pocket watches, keywinds, RR's, repeaters, unusual escapements, complicated watches, cases, dials, movements, etc. Ship insured/registered with asking price; you'll get immediate reply. **SATISFACTION GUARANTEED OR YOUR MERCHANDISE RETURNED PROMPTLY.** Daniel Weiss, P.O. Box 14540, Philadelphia, PA 19115.

IMMEDIATE CASH PAID for Gold, Silver, Platinum, any form! Jewelry scrap, filings, gold filled, sterling! Immediate top dollar cash offer return mail! Satisfaction guaranteed. Ship insured/registered mail to: American Metals Co., St. Andrews Branch, P.O. Box 30009H, Charleston, SC 29407.

STERLING FLATWARE STOCKS—New or used needed. Call us before you sell for scrap. Also wanted: silver, diamonds, gold scrap, coins and coin collections. Call or write: Mr. Neff, HT, WFN Enterprises, 2300 Henderson Mill Rd., N.E., Suite 318, Atlanta, GA 30345. Ph. 404/938-0744.

IMMEDIATE CASH PAID!! Old Mine and Old European cut diamonds. Especially needed: Stones over 1 carat. Ship with phone number for highest offer, or call Mr. Neff, (404) 938-0744. W. F. N. Enterprises, Inc., HT, 2300 Henderson Mill Rd., NE, Suite 318, Atlanta, GA 30345.

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WATCH PARTS & EQUIPMENT. Trade shop closed! All must go! Cleaning machines, systems galore! Offers call 616-349-4442.

Flourishing clock shop on the East Coast. Established 1939. Owner retiring. Contact Bill Shelton, 806 Harrington Ave., Norfolk, VA 23517 (804) 625-5752.

Jewelry and Gift Shop. Perfect for watch repairman who wants small town!! Potential annual purchasing power of shopping area is \$15 million. (715) 644-2512. Stanley, WI 54768.

JUNGHANS QUARTZ BATTERY MOVEMENTS STANDARD & MINI 1-10, \$6.75 ea. 10 and up, \$5.95 ea. Hands included. \$2.00 handling. Jangre Co., 12732 N.E. Hassalo, Portland, OR 97230.

RETIRING - Clock Shoppe - Southern California, Hi Desert - Elite Store - Heavy Repairs - Good Inventory - Excellent Lease - (714) 365-9676 days; (714) 365-9363 evenings and Sundays.

\$10.00 brings 12 each male and female crown necks in taps 8 and 10, plus samples of our 'A' quality Swiss spring bars. P.O. Box 774, Greenville, Mississippi 38701.

FOR SALE: VC-10 cleaning machine, Vibrograph B200 timing machine. M. Rugroden, Rt. 4, Box 350R, Bemidji, MN 56601. (218) 751-8071.

Established jewelry store in southern Indiana. Inventory, watchmaking, jewelry repair and engraving tools and equipment. Mrs. Arlene Chittenden, Lawrenceburg, Indiana 47025. Phone: Home (812) 537-3570; Business (812) 537-8228.

SEIKO QT-99 QUARTZ TESTER and many other tools and equipment used in the repair of quartz watches for sale. Used only 6 months. For details send S.A.S.E. to G.T. Electronic Co., 142 Howitzer Rd., W. Columbia, SC 29169.

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Miscellaneous

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Dates To Remember

SEPTEMBER

- 2-3—United Lapidary Wholesale Show; Houston, TX
- 3-7—GLDA Inc., Tucson Gem Show; Marriott Hotel, Hilton Hotel, Tucson, AZ
- 4-9—BIJORHCA Jewelry, Silver, Clock and Gift Fair; Paris, France
- 5-7—Charlotte Gift, Jewelry and Housewares Show; Charlotte Merchandise Mart, Charlotte, NC
- 5-7—Intermountain Jewelers Assn. Convention for Utah, Idaho, Nevada and Wyoming; Prospectors Square, Park City, UT
- 5-9—International Gold and Silver Show of Arezzo; Arezzo, Italy
- 6-7—United Lapidary Wholesale Show; Dallas, TX
- 6-7—Ohio, Indiana, Kentucky and West Virginia Jewelers Assns. Mid-America Jewelry Show; Cincinnati Convention Center, Cincinnati, OH
- 6-10—International Watch, Jewelry and Silver Trade Fair; Earls Court, London, England
- 6-11—Dallas Fall Gift, Jewelry and Housewares Show; Dallas Market Hall & The Anatole Hotel, Dallas, TX
- 11-12—United Lapidary Wholesale Show; Chicago, IL
- 11-14—Florida Jewelers Assn. Convention; Marriott Hotel, Fort Lauderdale, FL
- 12-13—Iowa Jewelers & Watchmakers Assn. Convention and Trade Show; Best Western Airport Inn, Des Moines, IA
- 13—Middle Atlantic Travelers Assn. Jewelry Trade Show; The Rouse Building, Columbia, MD
- 13-16—Atlanta Fall Gift Show; Atlanta Merchandise Mart, Atlanta, GA
- 19-20—North Dakota Jewelers & Watchmakers Assn. Convention; Seven Seas Motel, Mandan, ND

- 20—Massachusetts Watchmakers Association 25th Anniversary Convention; MA
- 20-22—Miami Beach Gift and Jewelry Show; Miami Beach Convention Center, Miami Beach, FL
- 21-23—Nebraska & South Dakota Jewelers Assn. 1981 Convention; Holiday Inn, Kearney, NE
- 23-24—United Lapidary Wholesale Show; Peoria, IL
- 26-28—New Jersey Jewelers Assn. 1981 Eastern States Jewelry Trade Show; Lafayette Hotel, Atlantic City, NJ
- 27-28—United Lapidary Wholesale Show; Minneapolis, MN
- 27-29—Phoenix Gift & Jewelry Show; Phoenix Civic Plaza, Phoenix, AZ

OCTOBER

- 3-4—Maryland Gem Shows, Washington D.C.; Westpark Hotel, Tyson's Corner, VA
- 4-6—Orlando Gift Show; Howard Johnson's Florida Center, Orlando, FL
- 4-7—Philadelphia Gift and Jewelry Show; Holiday Inn, City Line, Philadelphia, PA
- 7-11—Jeweltime 81; Shangri-la Hotel, Singapore
- 10-12—Pennsylvania Jewelers Association Annual Convention; Pocono Hershey Resort, White Haven, PA
- 11-13—St. Louis Gift and Jewelry Show; Cervantes Convention Center, St. Louis, MO
- 17-18—Illinois Watchmakers Convention; Townhouse Motel North, Morton, IL
- 24-25—Florida State Watchmakers Association Convention; The International Inn, Orlando, FL

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