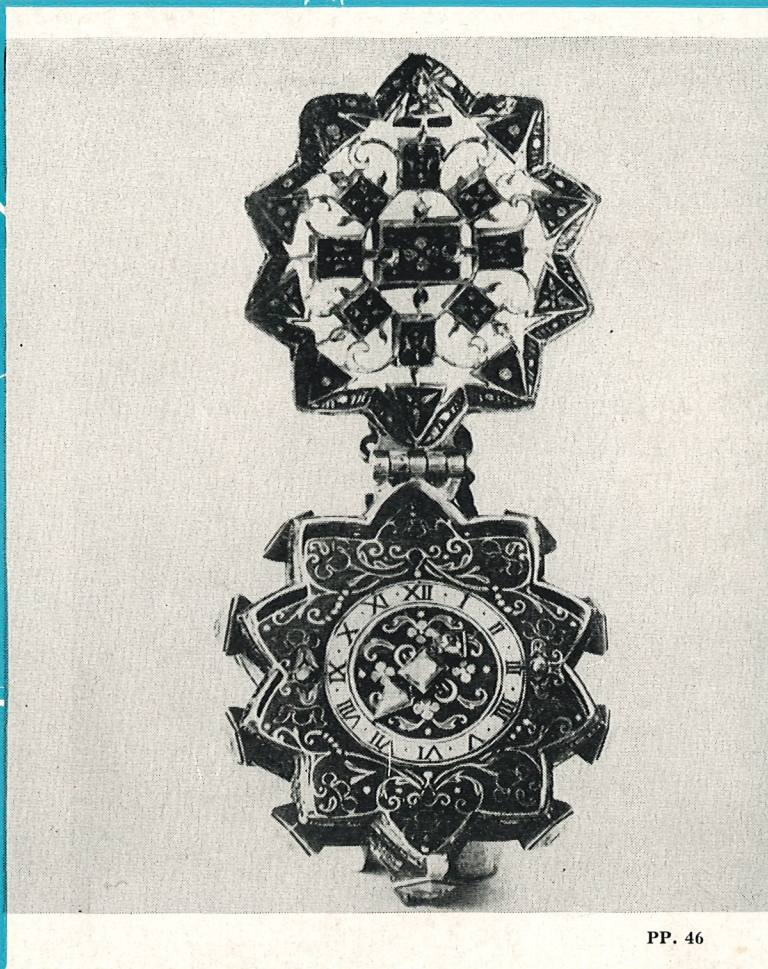


The H.I.A. Journal

OFFICIAL PUBLICATION OF THE HOROLOGICAL INSTITUTE OF AMERICA.



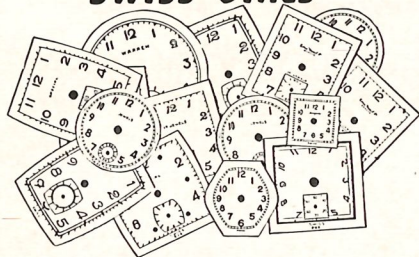
PP. 46

AUGUST, 1949

SUMMER SPECIALS

FROM THE HOUSE OF FRIENDLY SERVICE

SWISS DIALS



24 new dials — black and gilt figures including many older patterns such as 6½ ligne oval, 6¾ rectangular, etc. for 5 ligne to 11 ligne Swiss bracelet watches.

Order No. C117L \$1.95

New Late Model dials — assorted openings with black or gilt figures — no 2 alike — 6 ea. for AS976 — FF120 — AS970 — AS984.

No. C200L — 24 dials \$5.75

YOU CAN FIT:

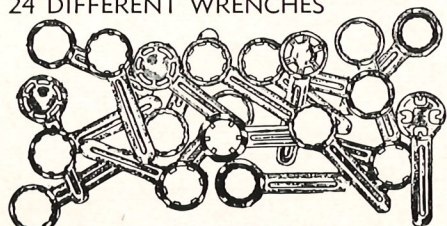
almost any pocket watch case needing an antique crown with this assortment of 12 each of 12, 16, 18 size, acid test yellow gold plate crowns.



No. C185 — 36 crowns \$5.75

YOU CAN OPEN:

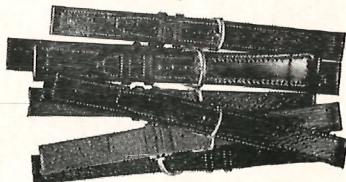
A WIDE VARIETY OF WATERPROOF CASES WITH THIS ASSORTMENT OF 24 DIFFERENT WRENCHES



—GLADLY SENT ON TRIAL.

No. C138L \$5.95

LEATHER STRAPS

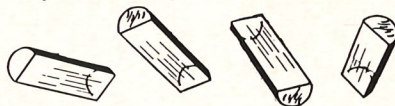


— accumulated from broken lots including assorted lengths, colors and widths. Mounted on fresh display cards.

No. C140L — 3 dz. . . \$9.75

No. C141L — 1 dz. . . \$3.50

ROLLER JEWELS



1 gross package each bracelet and pocket sizes — assorted lengths to fit both Swiss and American models.

288 JEWELS!

Order No. C 221 \$4.95

BURTON M. REID SONS INC.

"The House of Friendly Service"

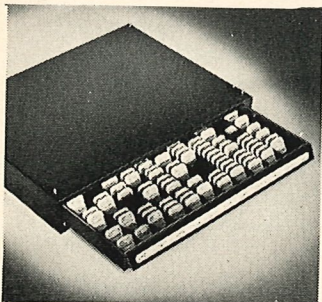
1st and Washington

Springfield, Illinois

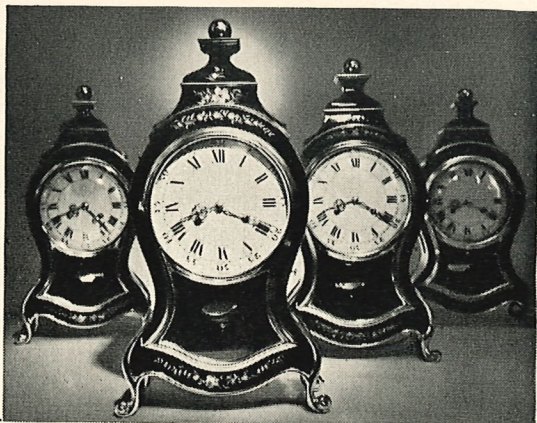
...“It’s Watch Inspection Time”... September 12 to 17

TIME TO GET IN ON THE BIG 3-WAY PROMOTION OF THE WATCHMAKERS OF SWITZERLAND

- ★ Special “Watch Inspection Time” Ad.
- ★ Special “Watch Inspection Time” Merchandising.
- ★ Special “Watch Inspection Time” Contest with these valuable prizes.



More than \$1500 worth of prizes! 4 grand prizes — each a wonderful Swiss-made Neuchâtel clock, PLUS 20 awards of merit—each a well-stocked Official Cabinet for Swiss Watch Repair Parts.



IT'S EASY! All you do is take a snapshot of your store window and write a letter.

WIN valuable prizes—and increase your repair business! Enter today!

Send in the official entry blank on the fourth page of this advertisement. You'll receive by return mail a merchandising booklet containing complete contest rules and instructions, PLUS a free “Watch Inspection Time” display.

Every jewelry store, jewelry department, or watch repair department can submit one entry. Entries will be accepted from midnight September 17, until midnight October 12. Judging will be by leaders in the jewelry industry.

Each entry will consist of a photo or snapshot of your display window taken during “Watch

Inspection Time,” September 12-17 (to qualify, your window *must* include the free “Watch Inspection Time” display furnished by the Watchmakers of Switzerland), and a letter of 150 words or less on the subject “How I Made ‘Watch Inspection Time’ a Success.”

See the Next Three Pages for
Advertising and Merchandising News
and Official Contest Entry Blank.

The WATCHMAKERS OF SWITZERLAND



ADVERTISING will help you make "Watch Inspection Time" a Success

This special "Watch Inspection Time" ad will make 69,291,962 reader-impressions in Life, Saturday Evening Post, Time, Country Gentleman, and Farm Journal.

TO STRESS THE IMPORTANCE of good watch repair, and to give due credit to watch repair experts everywhere, The Watchmakers of Switzerland commissioned the famous artist, Norman Rockwell, to create the illustration for this special ad.

In addition to reminding customers that "It's Watch Inspection Time," this advertisement points out the importance of watch repair, tells readers that the jeweler and his repair craftsmen are best equipped to service watches economically and promptly. And, as in every ad, your customers are told how important it is to go to their jeweler for "a quality watch, with a fine jeweled-lever Swiss movement."

"Watch Inspection Time" makes the Official Swiss Watch Repair Parts Program more important than ever—so be sure that you are getting full benefit of all these services:

1. The Official Swiss Watch Repair Parts Information Bureau. Located at 730 Fifth Avenue, New York 19, N. Y., to answer repair questions.
2. The Official Catalogue of Swiss Watch Repair Parts which sets up the new, standard system of identifying and ordering repair parts for Ebauches movements.
3. The Official Dictionary of Watch Parts. Recommended for large watch repair departments and highly skilled watchmakers.
4. The Official Package for Swiss Watch Repair Parts. Now being used for staffs and stems of the most widely used Ebauches movements.
5. The Official Cabinet for Swiss Watch Repair Parts. New, efficient design that holds both packaged and unpackaged parts. Order from your supplier.
6. A Speaker's Kit—for talks on the Repair Program — includes display material, slides and instructions.
7. And remember—Part II of the Official Catalogue will be distributed in the latter part of this year.

Turn Next Page for Free
Merchandising Display and
Official Contest Entry Blank.



Norman
Rockwell

What makes it tick?

AS THIS FASCINATING capsule of wheels and gears and springs ticks off the seconds, most of us take it for granted that the delicately balanced mechanism will keep on miraculously turning power into time. And so it will—if the watch you wear has a jeweled-lever Swiss movement and you give it good care.

No sound is so sweet to a watchmaker's ear as the gentle tick of a fine watch. He knows that the *works and workmanship* inside the watch

determine its accuracy and long life. He'll tell you that it pays to buy a quality watch—with a fine jeweled-lever Swiss movement.

To give the best wear, your watch deserves good care. Your jeweler and his repair expert know what makes a fine watch tick. Thanks to them—and to the Official Swiss Watch Repair Parts Program—any watch with a quality jeweled-lever Swiss movement can be serviced economically and promptly.

For the gifts you'll give with pride—let your jeweler be your guide

The WATCHMAKERS OF



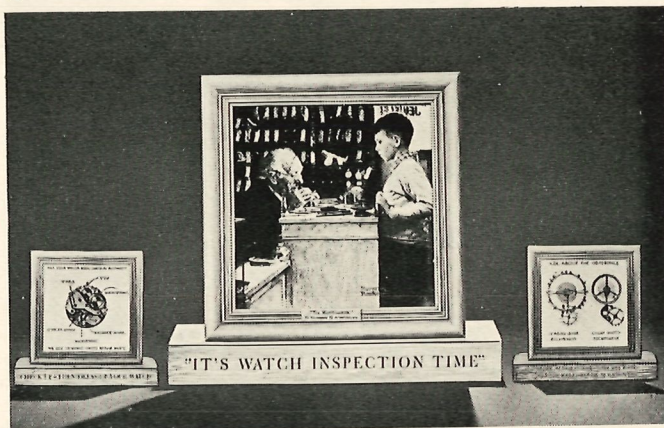
SWITZERLAND

"It's Watch Inspection Time," September 12th—17th.

© 1949 Swiss Federation
of Watch Manufacturers

MERCHANDISING will help you make "Watch Inspection Time" a Success

FREE, full color display can help you win the contest and boost your repair business!



THIS FULL-COLOR DISPLAY will spark your store window . . . build store traffic . . . stimulate your repair business! And—the way you use it can help you win the "Watch Inspection Time" contest. It features the same full-color illustration by Norman Rockwell that appears in the "Watch Inspection Time" ad.

And, as a further help, The Watchmakers of Switzerland have prepared a special "Watch Inspection Time" booklet. It's packed with sales suggestions and ideas, plus extra ways of tying in with "Watch Inspection Time," and complete contest rules.

Remember that watch repair business is not only profitable in itself (surveys show that repair accounts for as much as 24% of jewelry store sales volume) but it is one of your best ways of getting new customers. A well-run watch repair service brings potential customers to your store, offers an opportunity to show merchandise, and gives you a chance to build repeat business.

Take advantage of "Watch Inspection Time"—September 12-17. See how your store volume will increase when you get in on all three parts of this big promotion . . . the *Advertising—the Merchandising*—and the *Contest*.

The WATCHMAKERS OF SWITZERLAND



You Get Both the "Watch Inspection Time Display" and Merchandising Booklet FREE When You Enter the "Watch Inspection Time" Contest. Send in this Official Entry Blank TODAY!

To: THE WATCHMAKERS OF SWITZERLAND
c/o The Swiss Watch Repair Parts Information Bureau
Contest Department
730 Fifth Avenue, N. Y. 19, N. Y.

I want to enter the "Watch Inspection Time" Contest, sponsored by The Watchmakers of Switzerland. My store is cooperating in the Official Swiss Watch Repair Parts Program. I'm looking forward to receiving and using the free "Watch Inspection Time" display

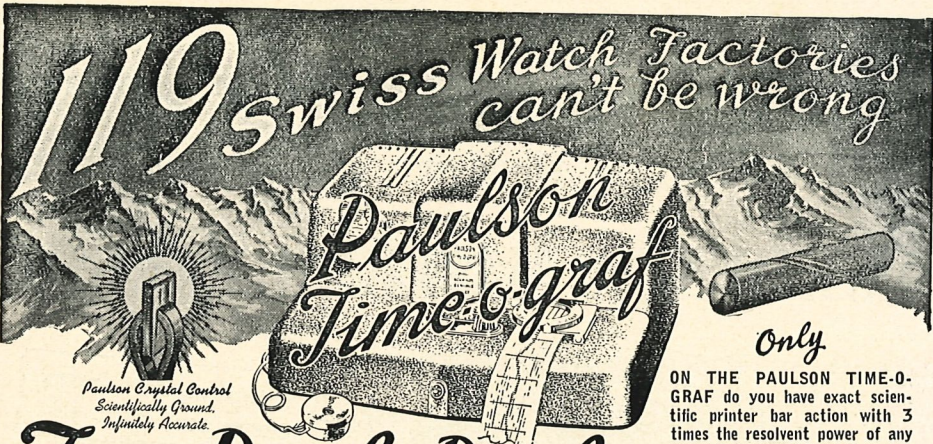
MY NAME IS _____ (PLEASE PRINT)

THIS ENTRY IS FOR _____ (GIVE STORE NAME)

STORE ADDRESS _____

CITY AND STATE _____

SIGNATURE _____



Only

ON THE PAULSON TIME-O-
GRAF do you have exact scien-
tific printer bar action with 3
times the resolvent power of any
other timing machine.

For Peak Performance

THE TIME-O-GRAF

USED IN THOUSANDS OF JEWELRY STORES AND AMERICAN FACTORIES

*is the Choice of 119 Swiss
Watch Manufacturers*

BECAUSE

Only

ON THE PAULSON TIME-O-GRAF with continuous tape record, it is possible to get all the answers including the train, pallet stone, roller jewel, etc., on one complete record.

Only

ON THE PAULSON TIME-O-GRAF can you regulate your watch and see exactly what it is doing as you move the regulator. Wonderful for hairspring work, too.

Only

ON THE PAULSON TIME-O-GRAF is it possible to reveal a continuous record of all positions on one tape without stopping the machine.

Only

The PAULSON TIME-O-GRAF gives you superior scanning speed and also unparalleled scientific accuracy.

**PROVE IT YOURSELF WITH A
NO RISK TRIAL**

Only **\$490⁰⁰**

LESS 2% FOR CASH

PAYMENT PLAN AS LOW AS

**\$24²⁷ PER
MONTH**

Henry PAULSON & Co.
131 S. Wabash Ave., Chicago 3, Ill.

USE THIS HANDY COUPON

HENRY PAULSON & CO., 131 S. Wabash, Chicago 3

Please send information on no risk trial on Paulson Time-O-Graf.

Please send Paulson Time-O-Graph at \$490 less 2% for Cash.

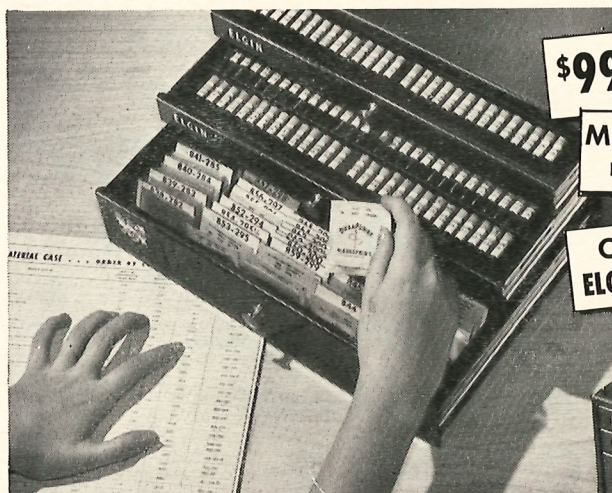
Please enter order for Time-O-Graph—\$100.00 with contract. Balance \$24.27 per month for 18 months.

Name.....

Address.....

City..... State.....

Now! give faster repair service
 ...save money on parts with
ELGIN'S NEW MATERIAL CABINET



\$99⁵⁰ complete with index cards and materials

Material alone worth **\$135⁰⁰**; makes the cabinet **FREE**

Order **NOW** from your **ELGIN** material wholesaler



MOST COMPLETE, BEST ARRANGED CABINET OF ITS KIND!

Here's what you have been waiting for! This new Elgin material cabinet is a system for making your Elgin watch repair work speedier and easier. And you save substantially on the material and parts when you buy them in this complete convenient unit.

Has three easy-operating drawers; 29 compartments for mainsprings alone, holding 61 mainsprings. Stock-expansion room.

Following material comes in cabinet: *Winding Arbors, Clicks, Winding & Setting Clutches, Hour and Minute Hands, Second Hands, Balance Hole Jewels, Balance Cap Jewels, Roller Jewels, Setting Levers, Bevel Pinions, Cannon Pinions, Case Screws, Balance Staffs, and Mainsprings, totaling over 400 parts.*

Cabinet is in size approved by the Watch Material Distributor Association.



"Remember—no other watch ... only **ELGIN** has this winning combination."

Frank H. Knapp

- Fashion Academy award-winning style
- The DuraPower Mainspring*

ELGIN'S 85th anniversary values backed by big advertising campaign.

*Made of "Elgiloy" metal. Patent pending

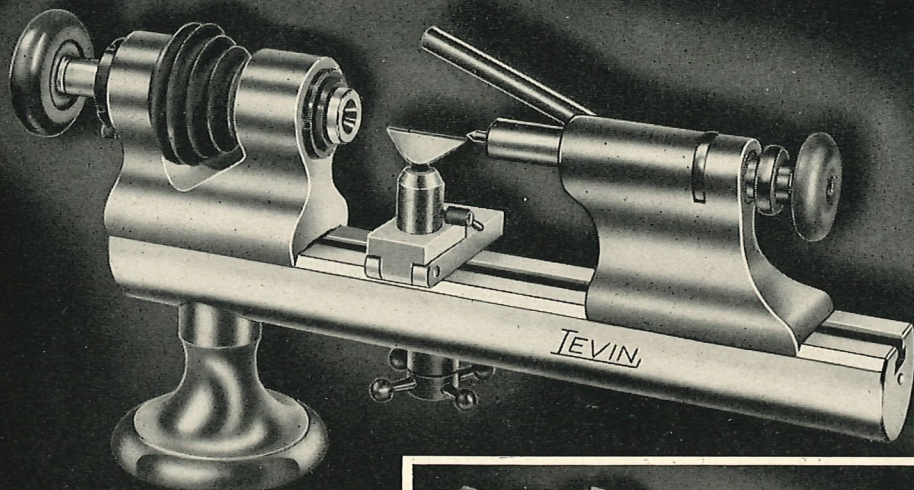


ELGIN NATIONAL WATCH COMPANY
 Elgin, Ill.

LEVIN Introduces A NEW Lathe

not just another ball bearing lathe but...

A PRE-LOADED BALL BEARING LATHE



MODEL D LATHE, CAT. No. ABBT

ANOTHER ADDITION TO THE LEVIN LINE OF LATHES

HIGH PRECISION

The new **PRE-LOADED BALL BEARING** spindle has resulted in the highest degree of rigidity and precision obtainable.

EVEN SPEED ASSURED

Low friction of bearings enables lathe to make heavy cuts without slowing down, making it also ideal for light manufacturing.

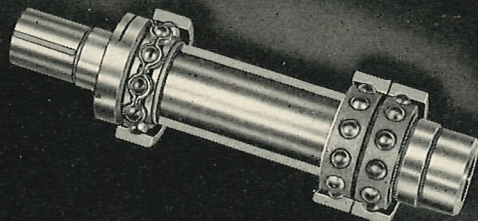
NO OILING NECESSARY

Lubricant is sealed in and is sufficient to last the life of the bearing.

GENUINE **LEVIN** TOOLS

CARRY THIS TRADEMARK

ASK YOUR DEALER FOR 1949 CATALOG "E"



BALL BEARING SPINDLE ASSEMBLY

AFTER a long period of research, we are proud to offer two new lathes equipped with high precision, **PRE-LOADED BALL BEARINGS**. Model C, using standard WW wire chucks (5 mm capacity). Model D, using larger chuck with 8 mm capacity. Both models have same center height as all WW type lathes.

LOUIS LEVIN & SON, INC.
782 E. PICO BLVD., LOS ANGELES

Speaking of Success . . .

Let's Look at the Records

Washington Tech graduates are 100% Employed!

WATCHMAKING AND ENGRAVING

One of the country's largest and fastest growing industries. Washington Tech men undergo a course of deep-down training that qualifies them as first class craftsmen in the field. Many of our graduates are holding the most responsible, top salaried positions.



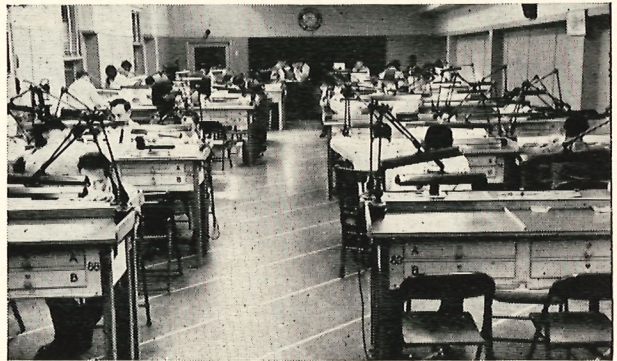
SECURITY SUCCESS BIG EARNINGS

*Approved
for Veterans!*

- High Salaries
- Tools Supplied
- Individual Instruction
- Dignified Profession
- Experienced Teachers
- Day and Night Classes
- Member N.A.H.S.

Special Engraving
Class for Jewelers
and Watchmakers

DON'T DELAY!
Write today
for Booklet.
No obligation



Washington
Technical School
Incorporated

WATCHMAKING & ENGRAVING
C & M BLDG. 9TH AND D STS., N.W.

We Believe In Brand Names

K & D Staking
Tools

Levin Tools

L & R Products

you should too because . . .

SPEIDEL . . . GEMEX
J. B.
WATCH BANDS

QUICK FIT
BEST FIT
NEWALL SYSTEMS

GENUINE WATCH
MATERIALS

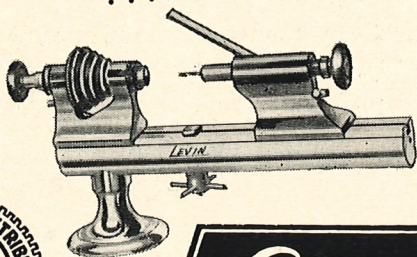
They're Trademarks of Quality

The Pledge of Responsibility

The Guarantee of Satisfaction

Today when your dollars can't be squandered on unknown, take-a-chance, maybe-it's-good and maybe-it-isn't merchandise, we're proud to have you shop at SOBEL'S. We protect you by buying the best possible merchandise from the most reputable manufacturers. Yes, we cling to our standards of quality—for we know that dependability will continue to bring you to our doors.

THE BEST YOU CAN BUY IS THE BEST BUY!
. . . AND, IT ACTUALLY COSTS LESS



Watchmaker's Lathes
\$139.10

Model B with plain chuck holding tail stock. Specially designed for modern watchmakers. Fully nickel plated.



**SAME DAY
MAIL SERVICE!**

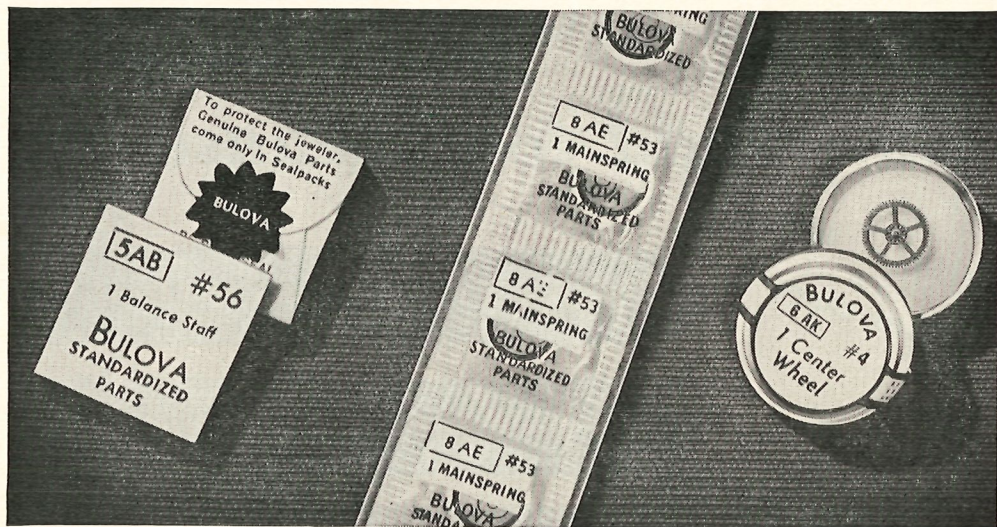
Eugene Sobel Co.

610 9th St. N. W.

WASHINGTON 1, D. C.

WHOLESALE DISTRIBUTORS • JEWELRY • WATCH MATERIALS • TOOLS

For Your Protection...



GENUINE BULOVA PARTS are packaged ONLY IN THESE 3 WAYS!

Look for them always—accept no others!

When your Bulova parts come packaged in any of these three ways, you are assured that each part is genuine—truly standardized, individually packaged and factory sealed. In addition, you

get convenience and ease of handling to make your repair work easier and faster. And, most important, these parts enable you to do a perfect job *always*—a job that means customer good-will for *you!*

AVAILABLE AT YOUR LOCAL BULOVA MATERIAL JOBBER

Use the NEW Bulova material cabinets for stocking these parts. Your jobber

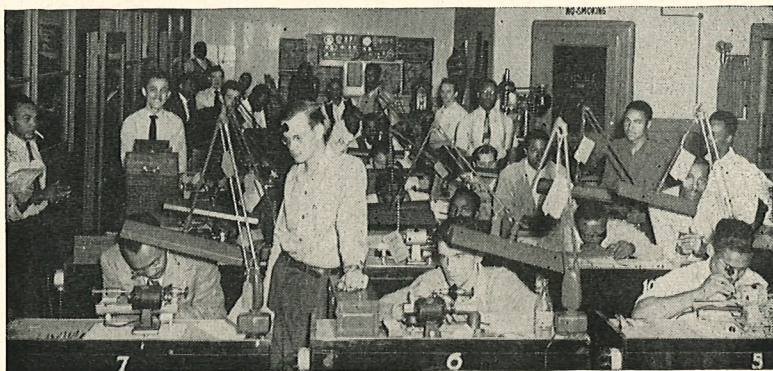
has these cabinets available for immediate delivery: Ask to see them!

BULOVA WATCH COMPANY, FIFTH AVENUE, NEW YORK

Morgan Vocational Schools

BALTIMORE, MD. and RIDGELEY, W. VA.

"Certified Schools for Certified Watchmakers"



School at Baltimore, Maryland



School at Ridgeley, W. Va.

Courses offered in
Horology, Precision, Mathematics, Machine Work and Mechanical Drawing

P. K. MORGAN, Owner of the Schools

Works With You, Not By You

YEARS OF RESEARCH AND DEVELOPMENT PROVE IT 'L&R-PERFECT'



Just press the starter button and you'll enter a new world of watch cleaning. You'll never be satisfied with less than this all-new, automatic profit-builder that works with you, not by you!

- Fully automatic through cleaner, rinse, second rinse and dryer.
- Complete cycle for 'L & R-Perfect' results—12 minutes. (Determined by L & R watchmaker-engineers and research chemists.)
- Hydraulic and mechanical operation for smooth, easy action.
- L & R's own NEW automatic reversing motor produces maximum mechanical efficiency by continuous reversing of baskets in solutions only!
- Automatically controlled one-direction spin-off in each solution jar. (Assures ultimate cleaning

results and keeps solutions in better condition for longer periods of time.)

- Controlled one-direction rotation in the drying chamber, together with the use of a separate motor and fan, produce absolutely dry parts.
- L & R method of watch cleaning eliminates air pockets in solutions which cause stains and spots. (Overwhelming trade preference for L & R equipment proves efficacy of L & R method.)
- Machine shipped complete with L & R No. 1 Basket and divider partition, Clock Basket, Clock Basket Inserts and L & R Cleaning and Rinsing Solutions.

List Price, \$249.50 complete

WATCHWORD OF THE WATCHMAKER

SOLD EXCLUSIVELY THROUGH

L & R

WATCH MATERIALS DISTRIBUTORS

Western Sales Office
55 East Washington Street
Chicago 2, Illinois

Main Offices and Plant
577 Elm Street
Arlington, New Jersey

Pacific Coast Sales Office
355 South Broadway
Los Angeles 13, California

How to handle and service ETERNA-MATIC

THE FIRST SELF-WINDING WATCH WITH A BALL-BEARING

The ETERNA-MATIC is the first self-winding watch ever produced with a ball-bearing in the movement. This development, the result of years of painstaking research on the part of **ETERNA**, assures friction-free automatic operation. It also simplifies for the watchmaker the problem of maintenance and repair. However, it is essential that he follow carefully the brief instructions which are given here.

ADVANTAGES OF THE BALL-BEARING

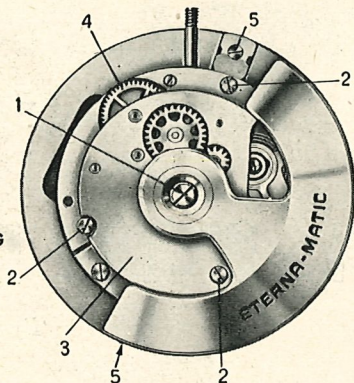
The ball-bearing in the ETERNA-MATIC consists of five tiny balls, each .0256" in diameter. A total of 25,500 of these balls will weigh approximately one ounce! Each is produced to extremely close tolerances.

The ball-bearing holds the oscillating weight. Its function is to provide the movement with an exceptionally durable, smooth-operating transmission with strong reserve power. The weight thus acts as a rotor and the movement derives power from a full 360° turn during any slight motion of the wrist. This assures jerkless and noiseless self-winding for the first time—both clockwise and counter-clockwise. Bumper springs, with their attendant repair problems, are eliminated. There are no click springs to fly off the bench.



Look for This
ETERNA-MATIC Symbol
on the Dial

ETERNA ...THE WATCH OF
PROTECTED ACCURACY SINCE 1856



HOW TO REMOVE THE MAINSPRING:

Release the three small screws (2) of the automatic bridge (3), *but do not remove the center screw (1) of the weight*. The entire automatic winding mechanism including the weight, is thus entirely removable. The barrel is now easily accessible and can be removed without touching the train.

HOW TO REACH THE BALANCE STAFF OR HAIRSPRING:

Proceed as above and remove the winding mechanism (3 screws).

When re-assembling the automatic bridge and weight, see that the pinion of the third automatic wheel (4) gears accurately into the ratchet. This can be helped by a slight clockwise winding of the crown. The crown wheel, contrary to standard movements, is not set on a steady pivot, but is mounted on a movable lever which should always remain movable.

HOW TO RE-OIL THE BALL-BEARING:

The ball-bearing should only be re-oiled when the winding mechanism has been treated with a cleaning solution which washes out the original lubricant in the bearing.

Use the same oil to lubricate the ball-bearing that you use for oiling the balance staff. Insert the oil between any of the five balls in the bearing.

Do not use mineral oils, thick oils or greases of any kind on the ball-bearing.

HOW TO REMOVE THE MOVEMENT FROM ITS CASE:

The case screws (5) should be released by two turns. *They should never be unscrewed completely.* Push the two holders slightly towards the center and tighten the screws slightly.

ETERNA WATCH CO. OF AMERICA, INC.
580 FIFTH AVENUE · NEW YORK 19

JUST PUBLISHED

- ✓ The Ideal Reference Work For Experts
- ✓ The Ideal Text For Apprentices

The WATCH REPAIRER'S MANUAL

By HENRY B. FRIED

Certified Master Watchmaker; Executive Secretary, Horological Society of New York; Vice-President, New York State Watchmakers' Association; Head of the Department of Horology, George Washington Vocational High School, N. Y. C.

HERE, at last, in this brand-new book is every fact you need to know about the modern techniques of watch repair! It begins with simple descriptions of watch construction, showing in clear, step-by-step pictures the parts of the watch, their action and position. Then it takes up, one by one, every job in repair work, starting with the easiest and gradually advancing until all the skills needed by the watch repairer have been fully explained.

The author, a certified master watchmaker and a noted teacher of horology, has covered his subject so thoroughly that the expert can use this manual as a quick, handy reference on any

topic—at the same time, the book is so well organized that the student or apprentice will find it a complete course in watch repairing.

Mr. Fried has included full information on the main divisions of the modern watch movement, ample directions for use of tools, for cleaning and overhauling a watch movement, for casing a watch, as well as chapters on individual part repairs, and valuable information on trouble-shooting. In addition, there is a complete dictionary of trade terms, tables of watch sizes for American and Swiss watches, in both English and metric units, and tables of mainspring sizes and widths. *306 packed pages, scores of vivid illustrations!*

BRIEF REVIEW OF CONTENTS

The Modern Watch ● Cleaning and Overhauling a Watch Movement
How to Case a Watch ● Adjusting a Cannon Pinion ● Mainspring Repairs ● How to Make a Stem ● Fitting a Balance Staff ● How to Make a Balance Staff ● Adjusting a Balance Staff ● How to True a Balance Wheel ● How to Poise a Balance Wheel ● Replacing a Pallet Jewel ● Replacing a Roller Jewel ● Causes of Overbanking (Out of Action) ● Adjusting Pallet-Guard Fingers ● How to Put a Watch in Beat ● Collecting and Studding a Hairspring ● General Repairs ● Trouble Shooting ● Appendices ● Index.

SEND NO MONEY

Prove to your own satisfaction how helpful this great book can be in your work. Examine it absolutely free for 10 days—return it if you are not entirely satisfied. Remember, send no money—just mail the coupon below.

— — — MAIL THIS FREE EXAMINATION COUPON — — —

[D. Van Nostrand Company, Inc.
250 Fourth Avenue, New York 3, N. Y.

[Please send me the WATCH REPAIRER'S MANUAL for free
[examination. Within 10 days I will either return the book or
[send you \$4.95 plus a few cents postage.

[Name]

[Address]

[City..... Zone..... State.....]

[..... HIA—Feb. '49]

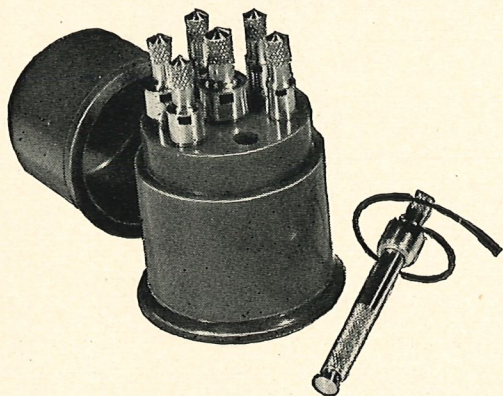
You'll Work in PERFECT COMFORT

● No wonder Bausch & Lomb Loupes out-sell all other makes combined. They are so light they can be worn for hours in perfect comfort . . . so tough and strong they are practically indestructible. They are precision made like a fine watch and have a "soft" interior finish which reduces annoying light reflections to a minimum. The precision ground lenses allow you to see better—work better. Ask your jobber. Bausch & Lomb Optical Co., 530-H Bausch St., Rochester 2, N. Y.



● *The popular bell shape. It looks better . . . feels better.*

BAUSCH & LOMB
Loupes



SCHILLING MAINSRING WINDERS

The recognized leader of main-spring winders now offered at new lower prices.

ORDER FROM
YOUR JOBBER

No. 101—Set of 7 in fine plastic stand. Handles ALL mainsprings from Baguette to 13 Ligne \$8.50
No. 102—3 smallest sizes of above set. \$4.00
No. 103—3 next larger sizes of above set. \$4.00

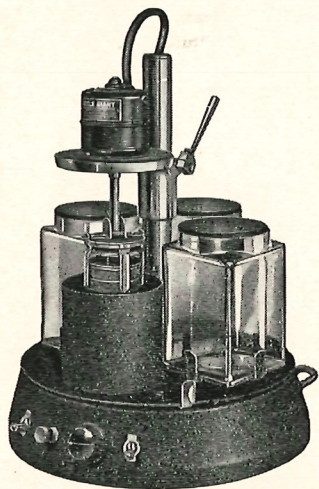
M. J. LAMPERT & SONS, Inc.

Exclusive Wholesale Distributors

352 FOURTH AVE.

NEW YORK 10, N. Y.

PEERLESS AND **LITTLE GIANT**
REG. U.S. PATENT OFFICE REG. U.S. PATENT OFFICE NO. 349883
WATCH CLEANING MACHINES



PEERLESS
REG. U.S. PATENT OFFICE

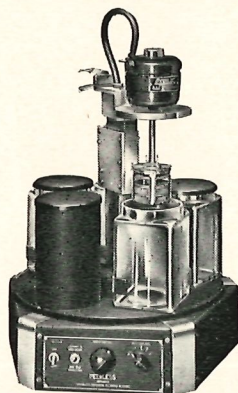
The Peerless is equipped with an automatic reversing operation which is controlled by a heavy duty Universal motor wound for both forward and reverse operation. This automatic action plus square jars prevents a vortex from forming in the solution and creates complete agitation of the solution over and through the basket at all times. Four square jars insure removal of all gummed oil or dirt particles commonly found on movement parts. No brushing necessary. Does complete thorough job. No. 36118

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JOURNAL

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This soap has been in use for years in Swiss watch factories to prevent rust due to perspiration. Simply wash the hands twice daily, using this soap, in the usual manner and your hands will remain free from perspiration. Consequently you will eliminate danger of rusted parts and tools caused by moisture from the hands.

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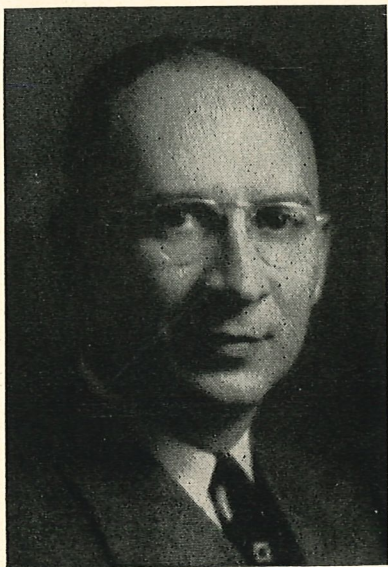
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HOW TO KEEP A FINE WATCH WORKING

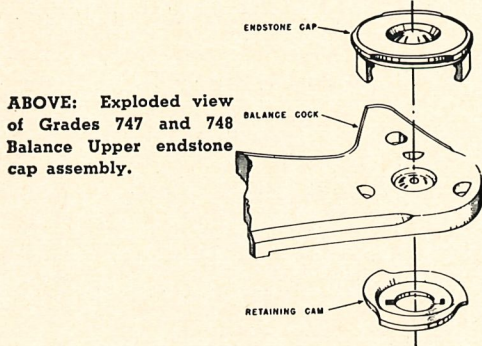
By R. W. SLAUGH of Hamilton Watch Co.

(Continued from July Issue)

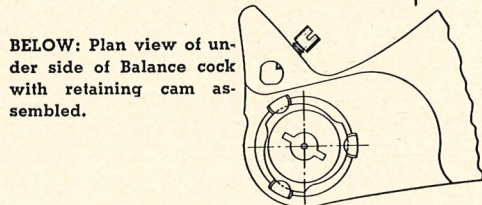


Richard "Dick" W. Slaugh

I have here some charts of recent Hamilton innovations which I believe will be helpful in this direction. The first of these shows



ABOVE: Exploded view of Grades 747 and 748 Balance Upper endstone cap assembly.

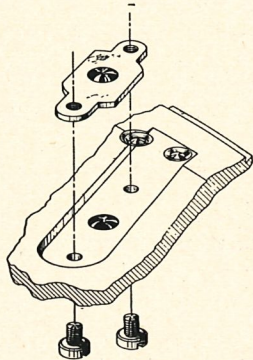


BELOW: Plan view of under side of Balance cock with retaining cam assembled.

the balance endstone construction introduced in the 747 8/0 size model.

The 747 balance upper endstone cap assembly is completely new in design. The new design affords accurate alignment of the upper endstone cap which, when the regulator is positioned around it, reduces the need for hairspring manipulation. The balance upper endstone cap can be easily and quickly replaced. Remove the balance cock and invert it and, with a screw driver of the proper width, unlock the cam as you would unscrew a screw and remove it. If the endstone cap does not drop free from the balance cock it can be *gently* pushed out by placing it on an anvil over the proper size hole and pushing on the feet. To replace the cap, reverse the dis-assembly steps, being sure that the retaining cam is snugly anchored but not forced.

The balance lower endstone cap on model 747, unlike this part on other Hamiltons, is held in place by two screws which enter



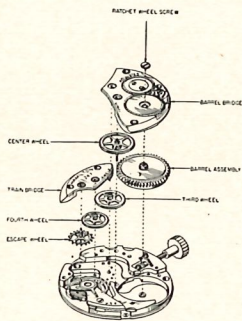
Exploded view of Balance lower endstone cap assembly.

from the train side and thread into the cap which is made of nickel plated steel. This feature is employed to eliminate the occasional annoyance of stripped threads in the pillar plate. Flat fillister head screws are used to secure a flat seating of the part. As-

sembly of the balance lower endstone cap to the pillar plate requires no special tools or methods. The cap can be positioned bottom side up on the bench; then the pillar plate with the recess for the cap aligned with it, can be placed over the cap. A rounded pointer can be used to line up the screw holes in the cap with those in the pillar plate. The screws then can be located and fastened.

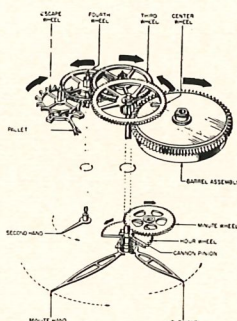
This chart shows the construction of Hamilton grade 748, a direct drive center seconds model. Disassembly of the grade 748 movement can follow the conventional order. Balance endstone cap construction is the same as in grade 747.

WHAT IT IS



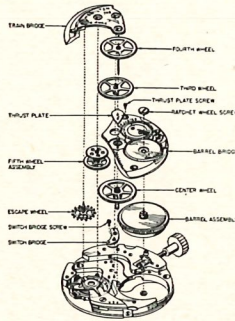
**HAMILTON 8/0 MOVEMENT GRADE 747
OFF-CENTER SECOND HAND**

HOW IT WORKS

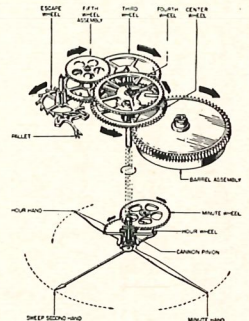


is not in contact with any surface. This precaution must be taken to insure retention of the oil in the jewel cup.

WHAT IT IS



HOW IT WORKS



**HAMILTON 8/0 MOVEMENT GRADE 748
CENTER SECOND HAND**

There is one other construction characteristic which influences the order of assembly. Since the third wheel of the train overlaps the winding wheel and obstructs accessibility to one of the winding wheel screws, the winding wheel and its hub must be assembled to the barrel bridge before the third wheel and the remainder of the train are assembled to the movement.

CUSTOMER SATISFACTION

Customer satisfaction is dependent to a large extent on the kind of service he or she receives. Whether it is good service depends on the training, the skill, the knowledge, and pride in fine craftsmanship of the watchmaker in the store and repair shop.

Another very important member of the Customer Satisfaction team is the jeweler or the jeweler's clerk who sells the watch. If this salesman is a well-rounded person, if he and his employer are in business for the long pull, he's likely to be the kind of an individual who has long since recognized

that watches, particularly fine watches, and especially Hamiltons, are bought by people for gift purposes. And as anyone can quickly understand, the gift of a Hamilton watch is not lightly given. Generally, they are gifts of significance and carry with them some of the finest sentiments of which human beings are capable. Put another way, a Hamilton watch sale is not only a matter of the head, it is a matter of the heart, too.

Now any intelligent, farseeing jeweler or his clerk, recognizing the circumstance of a fine watch sale, knows that he cannot oversell the product. The perfect watch has not been made. And it is not likely, so long as human hands have anything to do with them, that they all will be perfect. Unjust claims for accuracy and performance and loosely stated guarantees are not only unwise but, when applied to a quality product are usually unnecessary. Applied to a Hamilton watch, we feel, when we want jewelers and watchmakers to feel the same, that we have a personal responsibility to the ultimate owner of every watch we have made. And we do not encourage loose salesmanship of the order described.

Despite every effort we make to make every watch a true representative for all that Hamilton stands, we do find, occasionally, that a Hamilton watch will get out in the trade that simply is not up to standard. We are concerned enough that these watches even get to the jewelry store in an unsatisfactory operating condition. And we shall continue to do everything we can to prevent this. I don't suppose we can eliminate it and that is the reason why we have long sought the cooperative interest of jewelers and watchmakers in not only checking the product on inventory but to check it once again, *after the sale has been made and before the watch is turned over to the buyer*. You know and we do, too, that watches are damaged in transit, that they are occasionally dropped, and sometimes subjected to rather high temperatures in display windows and show cases. These

are all normal hazards in jewelry selling. And they support the recommendation we have long made that watches be given a final examination before they are turned over to the buyer. This is not only good insurance for customer satisfaction for Hamilton Watch Co., but it is equally good insurance for the jeweler.

The salesman can help a great deal by instructing the customer in the care of her watch. You will notice that I said "her" watch. I believe you will agree that even though men supposedly lead more active lives, men's watches are not subjected to the abuse that is given to ladies' watches. The abuse given a lady's watch while the owner goes about her ordinary housework is unbelievable. That they run at all under the conditions to which they are subjected attests to the marvelous mechanism that they are.

Steam from pots on the stove seeps into the case; condensation takes place and the result is rust. The same thing happens if the watch stays in the bathroom while the owner bathes. And wearing them or taking them into the laundry has the same effect.

Do you know where I find them in my bathroom? On the top of the radiator. That certainly doesn't help to keep the oil in place. How often does the watch owner reach into a hot oven with her watch on her wrist, or take it off and lay it on top of the stove or on a cold window sill. The resulting expansion or contraction is not conducive to keeping the oil in good condition.

How many have dropped or bumped their watches, picked them up, put them to their ears, found them still ticking, breathed a sigh of relief and promptly forget the incident. When the watch stops sometime later they have positively never had an accident with the watch and are insulted that the watchmaker should suggest such a thing.

How many carry them at least occasionally in a handbag along with a pack of cigarettes, a compact of face powder and a

bottle of perfume. Tobacco dust and face powder creep in around the stem and it has been proved that the volatile oils of the perfume get into the watch as vapors which have a detrimental effect on watch oil.

I heard recently of a customer who persisted in her opinion that her watch was a "lemon" because the jeweler could not regulate it closer than three minutes per month. Do you realize that a watch which gains or loses a minute a day is a far more perfect product than Ivory soap which is advertised as being 99 44/100 percent pure? Six-tenths of one percent less than perfection! If a watch was no better than this it would be off time by eight minutes

a day. Do you know that if an average automobile wheel made as many revolutions as a balance wheel, in a year's time it would have traveled 285,000 miles?

The clerk can explain that several minutes a week is excellent timekeeping for a small watch and tell the customer to wind it regularly, preferably in the morning, to keep it away from heat, steam and dirt, and to wear it on her wrist, not in her purse.

To sum up, "How to keep a fine watch running" is dependent on only one thing—Quality—Quality of product, Quality of business principles, Quality of relations with customers, Quality of service and last, but not least—Quality of salesmanship.

THE MODERN LATHE AND ITS DESIGN

By SAMUEL LEVIN

A great deal has been written about the watchmaker's lathe and its uses. Every watchmaker, as well as the student and apprentice, accepts the fact that the lathe is his most important piece of equipment and that the variety of jobs he can do with it is limited only by the number of accessories with which it is furnished. Nowhere in current literature is there anything which one may use as a guide when purchasing a new lathe. Each manufacturer, of course, claims to make the finest, and advertisements are replete with beautiful illustrations which may or may not be faithful portrayals of the actual tools. There is, then, some justification for a study of the lathe from the standpoint of its construction, rather than its uses.

Basically, the lathe is a device which revolves an object to be worked on while it is being cut. The process is known as turning. Even after the most rudimentary experience, one is aware of the fact that accuracy and good finish cannot be obtained unless the

work is rigidly mounted in the lathe. Any looseness or springing produces chatter, and once chatter appears, there is no longer any chance to produce a good finish or maintain dimensional accuracy. Chatter also has a very deleterious effect on tool life.

Today, almost all leading makers of watchmaker's lathes make them according to the so-called WW standards. What, actually, are these WW standards? When one speaks of a WW type lathe he means one which has a 50 mm (1.394") center height, 60° angular bed ways, 1.456" width on the top of the bed, an 8 mm chuck body and a 40° included angle on the chuck. There are some other dimensions involved, too, but these are the principal ones. Whether these particular dimensions are the most ideal for a watchmaker's lathe can be argued without arriving at any definite conclusions. What really matters is that by their almost universal adoption, chucks and other attachments have become interchangeable. Thus,

the watchmaker has the widest possible choice in his selection of accessories. Around these basic dimensions each manufacturer has designed his own lathe and applied his particular standard of workmanship.

The heart of a lathe is the spindle and the manner in which it is mounted. The spindle must be hollow so that a wire chuck can be inserted at one end and a draw bar for tightening it at the other end. When a chuck is tightened and released it actually slides back and forth a certain amount on the conical seat in the spindle. Since this sliding takes place under great pressure, it is necessary to guard against undue wear at the points of contact. The wear is minimized by making the spindle of hard steel. In spite of the fact that hardness is so necessary at the chuck seat, some lathes with soft spindles are still being made.

rested one end on the floor with the palm of the hand pressed down on the upper end. The rod would, of course, start to buckle when the pressure became great. Exactly the same thing takes place in a lathe spindle. If it is made with too thin a wall, it will spring when a chuck is tightened. Fig. 2 shows this condition. This leads to improper seating of the bearings, premature wear and even deflection of the spindle to a degree which may be readily noticeable. To make a spindle with a heavier wall means using more material and more labor, both for the spindle and the bearings. Thus, in a sense, one can judge the quality of a lathe by the thickness of the spindle wall and by noting whether or not the spindle is hard all over.

To insure a true running spindle, the chuck seat should be ground after the assembly, with the spindle running in its own

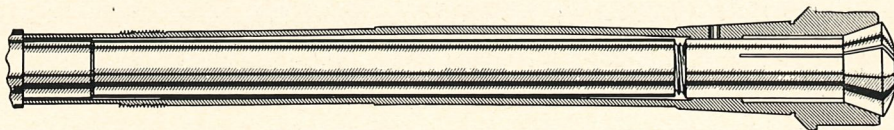


Fig. 2 A thin walled spindle springs when the chuck is tightened. (exaggerated)

When making a hard spindle, the blank is made with a small amount of extra stock on the outside as well as the inside. The surplus material is removed by grinding after the piece is hardened and tempered. The reason for leaving the surplus material on the blank is to make allowance for warping when it is heat treated. Certain makers, who try to economize, harden only the end of the spindle and leave soft the entire portion from the cone bearing to the rear end. This is a cheaper way of making a spindle, but it does not produce one which is as good as a spindle that is hard from end to end, even where shoulder of the draw-bar rests.

Tightening a piece of work in a lathe chuck produces a considerable amount of strain on the spindle. The effect is as though one took a long slender rod and

bearings. Particular attention should be given to the chuck key, which should not be too long or too wide, otherwise there may be trouble when inserting chucks.

Many attachments, such as index plates, screw cutting attachments, lever operated chuck closers, etc. must be mounted on the rear end of the spindle. Unless the lathe manufacturer provides the extra length on the spindle the watchmaker must forever forego the possibility of using them on his lathe.

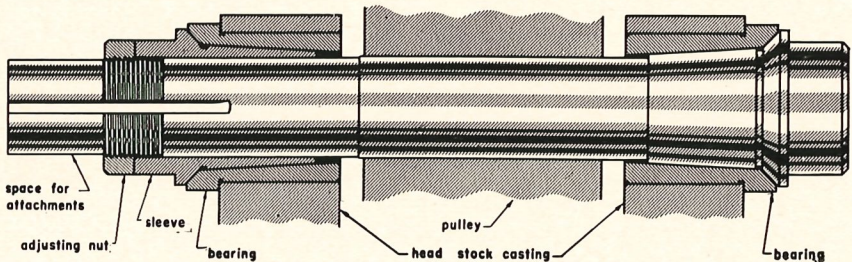
Two general types of bearings are used in lathes, sleeve bearings, as typified by the commonly used double cone bearings, and ball bearings which are just now come to the fore. Each type will be discussed separately.

Early in the development of the watchmaker's lathe the double cone bearing was

evolved in an attempt to equalize wear and simplify adjustment. How successful this arrangement has been may be judged from the fact that until recently practically all watchmaker's lathes and machinist's bench lathes used such bearings. Double cone bearings are currently made of either hard steel or bronze. Either will give satisfactory performance. The principal advantages of the hard steel bearing are that they require less frequent adjustment, and are less likely to become charged with abrasive, if one is not careful in using abrasive materials in the lathe. Soft bearings, however, will give years of good service. As proof, witness the many machines still in operation with babbit bearings.

occasionally it may be desirable to take the head stock apart for cleaning. If this is done, one should be careful to see that the key in the sleeve is in the key way of the spindle before pressing them together and that the pulley is so placed that the dog-point of the pulley screw will find its way into the hole in the spindle. These precautions should be carefully observed for many lathes have been badly damaged by disregarding them.

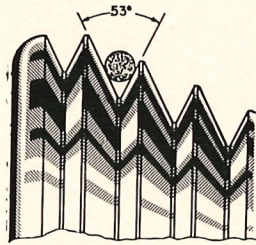
It is customary to drive a small lathe, such as a watchmaker's lathe, with a round belt. The actual form of the pulley groove is of some importance if belt slip is to be avoided. According to modern engineering practice, a 53 degree groove is most de-



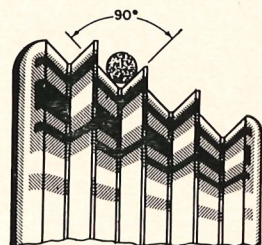
Lubrication of a cone bearing is usually accomplished by means of an oil groove in the bearing surface. The oil is applied at a hole which is uncovered by removing a dust cap or by means of an oil cup. Actually, an oil cup is of little benefit as the amount of oil which can be retained is governed by the capillary surface between the bearing and spindle. An excess amount of oil simply runs through and does no good.

Cone bearings are adjusted by a split nut on the spindle. Tightening this nut draws together the cones of the spindle and spindle sleeve, and presses them into the cones of the bearings. Thus, both side play and end play are eliminated at the same time. This adjustment must be made periodically as the bearings wear in. The spindle should be lubricated with a light spindle oil such as sewing machine oil and

sirable. Some pulleys are made with the angle of the groove as great as 90 degrees or more. These are inefficient because the belt must be tightened excessively in order to avoid slippage. Tightening the belt so much also leads to excessive wear on the bearings.

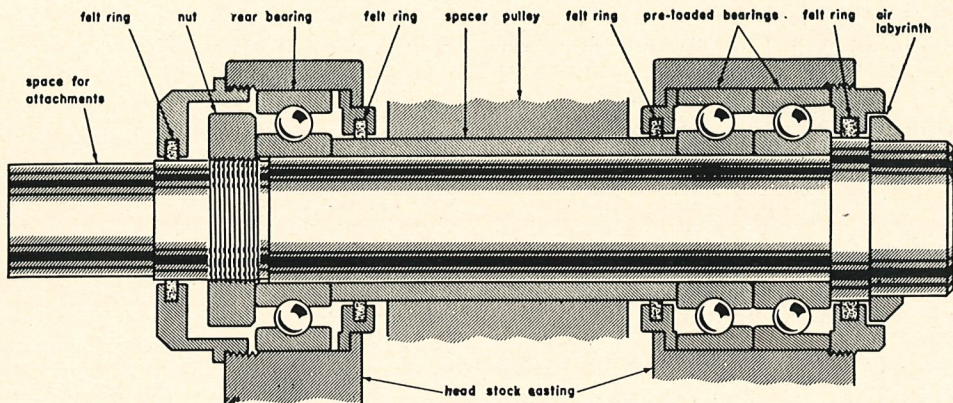


This belt will pull with minimum slip



This belt slips too easily

Of the materials from which pulleys and also the draw bar knobs are made, a linen base laminated phenolic is the most service-



able. This material, from which timing gears for automobiles are also made, consists of layers of high grade linen impregnated with bakelite. It is strong and long wearing. Moulded pull-up, made of rubber or bakelite, are fragile and easily chipped.

While ball bearings have been used for precision spindles for a number of years, they are just now coming into general use for watchmaker's lathes. The very words ball bearings have acquired such a connotation that their use automatically indicates quality. This is an erroneous concept. One should know that, just as all that glitters is not gold, so a ball bearing does not necessarily mean a precision bearing.

Ball bearings were developed to reduce friction, and they are so well able to do this that they are now also known as anti-friction bearings. It should be remembered, however, that to make a precision ball bearing spindle still takes the finest workmanship and engineering. None of the lathe manufacturers make the actual ball bearings themselves. These are made by the various ball bearing manufacturers who specialize in this field. It is of the greatest importance to know that, given the finest possible ball bearing, its performance will be governed by the manner in which it is built into the lathe and the care with which it is done. To make a precision ball bearing spindle requires the application of

sound engineering principles, and a poorly executed ball bearing spindle is much worse than one having plain sleeve bearings.

When a load is applied to a ball bearing, the ball is somewhat flattened at the points of contact with the inner and outer races and its diameter is lessened on the axis because of the deformation. This means that a ball on the opposite side of the bearing cannot touch both inner and outer races, because a clearance space has been produced. Fig. 5 shows this condition clearly.

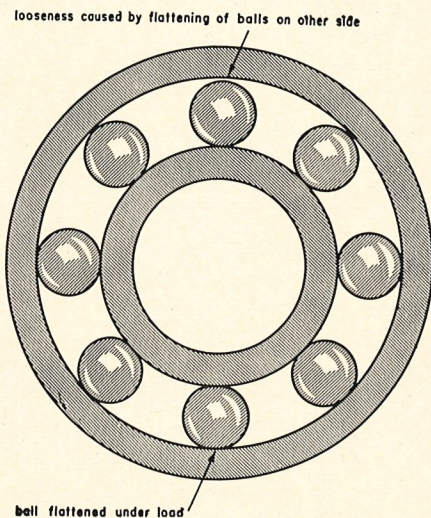
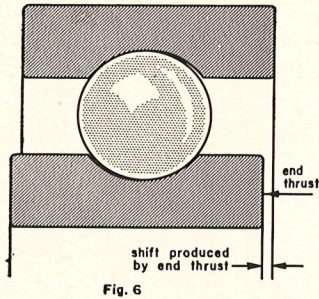


Fig. 5

Similarly, end thrust against a ball bearing causes the races to shift axially be-

cause of the deformation of the balls under the applied load (see Fig. 6). Since the



load on a bearing is seldom purely a radial load or pure end thrust, a combination of the two effects is produced. As a result of this brief analysis it is easy to see that by simply mounting a spindle on two ball bearings one does not have an arrangement which is satisfactory for a lathe. Such a spindle would have no rigidity and would chatter under even a very light load.

Some years ago ball bearing manufacturers developed the principle of pre-loading, which overcomes these objections to the application of ball bearings to precision spindles. This involved the use of bearings which are designed for heavy thrust loads and taking advantage of certain properties of a ball under a load.

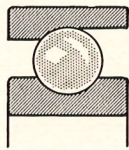
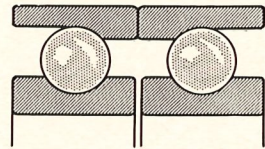


Fig. 8 shows an angular contact ball bearing which is made for heavy thrust loads. Note that it has a wide shoulder on one side of the outer race but only a small shoulder on the other side. Because of this, it can withstand end thrust in only one direction. Bearings of this type are generally used in pairs when thrust in both directions must be resisted.

Let us now consider once more what happens to a ball when subjected to a load. As we have noted before the ball tends to flatten out at the points of contact. However, because the load is applied to a ball, this flattening is not proportional to the load. Actually, there is a point beyond which any additional loading produces practically no additional deformation. It should be apparent that if it were possible to make ball bearings so that they would be constantly under a sufficient load, then the additional load caused by doing work in the lathe would cause practically no measurable deflection. This is accomplished in a pre-loaded bearing.



In Fig. 9 we have a pair of angular contact bearings placed side by side. Note that the inner races are made slightly thinner than the outer races, so that there is a space between them. Now suppose that, in Fig. 10, a load is applied to both inner races to squeeze them together and that they could be held thus permanently. We would then have a pre-loaded bearing. An additional uni-directional load, such as might occur when turning or drilling in a lathe, will produce almost no deflection because the initial loading has already stressed the bearings beyond what can be expected from the work load. Furthermore, while the thrust increases the loading on one bearing, it relieves it on the other, so that any tendency of the bearing to deflect is practically nullified.

Fig. 10 shows a complete bearing and spindle assembly for a watchmaker's lathe. The pre-loading is accomplished in assembly by tightening the nut on the spindle. This squeezes together the inner races of

the pair of angular contact bearings at the front of the spindle. The rear bearing is subject to little stress and pre-loading is not necessary at this point.

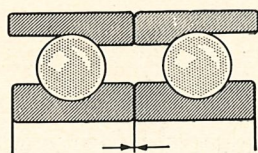


Fig. 10

It is possible to make a pre-loaded spindle as in Fig. 11. But, in this case the pre-load is taken by the head stock casting which, because it is cut out for the pulley, is not rigid enough. In spite of the fact that a head stock looks massive, it can be easily sprung and if the spindle design is faulty there will be chatter.

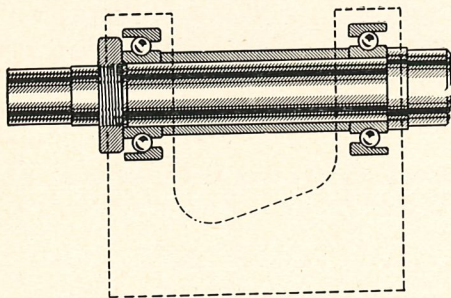


Fig. 11 An unsatisfactory arrangement for pre-loading.

The use of ball bearings makes the head stock a little bulkier. In an attempt to minimize this, some makers have reduced the thickness of the spindle wall so that smaller bearings can be used. This is jumping from the frying pan into the fire because by weakening the spindle its rigidity and accuracy are lessened.

Ball bearings are produced in various grades and the prices of the different grades may vary as much as tenfold. Ball bearings must be kept clean and it is, therefore, necessary to provide means to keep the dirt out. In the Levin lathe this is accomplished by placing a closely fitting felt ring on both

sides of each bearing. And as an additional precaution, at the nose of the lathe spindle, a ring is placed on the spindle to create an air labyrinth which will create an outward current to carry particles of dust away from the bearing.

The additional labor and material required to produce a precision ball bearing spindle add to the cost of a lathe and make it more expensive than one with plain cone bearings. However, where greater rigidity, higher spindle speed or the elimination of the need for oiling are important, the extra cost is more than warranted.

Until just a few years ago, practically all standard watchmaker's lathes were supplied with the old style tail stock whose spindle was about 8 m.m. in diameter and had a small taper hole at the working end. This type of tail stock is extremely limited in its application because of the difficulty of holding tools on a small taper shank. It is significant to note that in most cases this type of tail stock looks almost like new, while the rest of the lathe shows the signs of use.

In 1945 Louis Levin & Son took the lead in abandoning this obsolete form and adopted a new design with a chuck holding spindle. The end of the casting facing the head stock was made with a substantial overhang to clear a slide rest. Gradually, other makers realized the superiority of the chuck holding tail stock and followed suit.

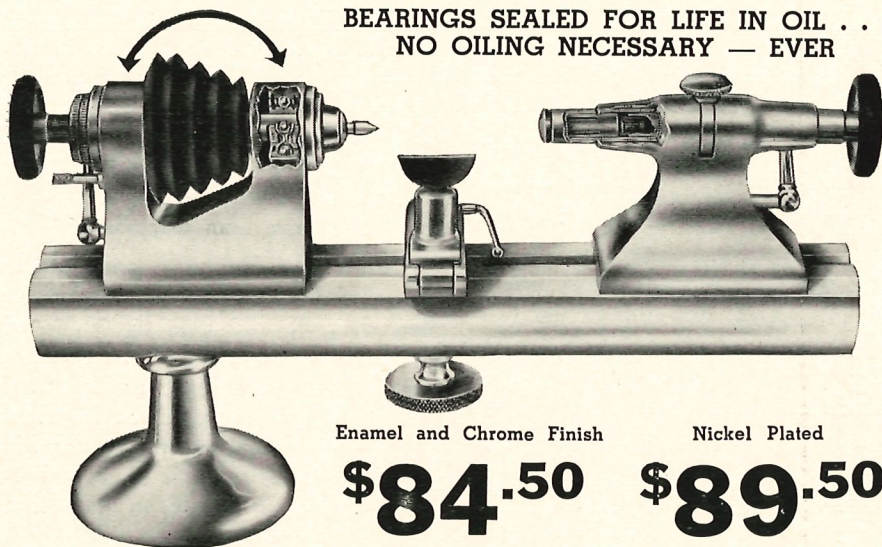
Since the tail stock is now a most important tool, one should consider its construction as much as he does the head stock. Here also, the spindle should be hard, preferably from end to end, and the wall of the spindle should be thick enough to obviate any danger of springing when a chuck is tightened. The spindle should be fitted closely enough so that there will be no side shake to destroy the accuracy of line up. This can be accomplished only if the hole in the tail stock casting has a smooth and precise finish. The spindle clamp must be

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BALL BEARING LATHE

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NO OILING NECESSARY — EVER



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The Marshall Pre-Loaded Ball-Bearing Lathe is constructed of the finest quality materials. Bearings are the best obtainable and sealed in oil for life. It is manufactured by experienced workmen who have been manufacturing Moseley and Peerless lathes for many years. They know the requirements of a fine watchmakers' lathe. That is why this lathe was more than 5 years from the Marshall Engineering Department to you. Marshall Engineers were not satisfied with producing just a ball-bearing lathe . . . they wanted a lathe with **UTMOST PRECISION**. A lathe that would deserve a place with Moseley and Peerless as America's best lathes of their types.

*Pre-Loaded Ball Bearings are scientifically designed to eliminate all possibility of side shake or end shake in the lathe spindle.

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Authorities have recognized for years that the most accurate and precise machines run on ball bearings. That is another reason why D. & E. Marshall Company absolutely guarantee precision performance and complete satisfaction with this lathe.

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THE WATCHMAKING INDUSTRY**

powerful enough to keep the spindle from turning when tightening a chuck.

The most sensitive tail stock is the one with a rack and pinion feed. With this arrangement one can use the smallest pivot drill and still have the necessary "feel" for delicate work.

While it is feasible to make an accurate micrometer stop for the tail stock spindle, it would add a great deal to the cost and its bulk would be objectionable because it tends to greatly reduce the travel of the spindle. Just providing a graduated screw does not make a reliable micrometer. The screw must be fitted accurately so that it has no play and any friction device or locking arrangement must resist the thrust of the spindle or it cannot be relied upon. If one takes these requirements into account, either the spindle must be made excessively long, or its travel is reduced to an insignificant amount. Actually, it is much more practical to use a simple collar on the spindle and, when necessary, locate it with an ordinary feeler gage.

By this time it is probably apparent to the reader that the quality of a lathe is dependent upon many details, no single one of which may be of paramount importance, but all of which add to the precision or ease of operation. Among such details, for example, one might mention that the binding levers for the head stock and tail stock should be on the sides and not on the ends of the castings where they may interfere with various attachments. It is easier to make the clamping bolts themselves out of smaller stock, but larger heads are an advantage because they have a greater gripping power. Likewise, the nut which tightens the T-rest to the lathe bed can be inexpensively made as a simple knurled disc. But a nicely machined nut with four ball and spokes is much easier on the hands and takes less effort to use. Where a watchmaker works in a restricted space he often swings his lathe aside to provide more working space on the top of his bench. To him it is a decided convenience to

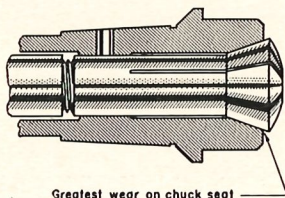
have a smoothly finished nut with large spokes instead of a commercial wing nut for fastening his lathe to the bench. And, we must not forget a well made tip over T-rest which has no play in the joint.

Without exception, watchmakers are almost as concerned about the appearance of a lathe as they are about its precision. In no other field is plating used on precision equipment. Where rust from handling is a danger, one simply wipes the tool with an oily cloth occasionally. Plating cannot be applied with absolute precision and, therefore, in order to maintain exact dimensions it must necessarily be applied as a thin layer. A heavy coating of plating destroys the accuracy of a tool and accomplishes nothing but a shiny appearance.

Plating is granular in structure and, therefore, somewhat porous. Unless treated with care it is not an absolute protection against rust. It is a good idea to wipe it with a slightly oily cloth occasionally. One need not use so much oil as to leave smears, just enough to leave a slight film.

The preparation for plating is as important as the plating itself. A good lathe is machined all over so that its form is smooth and concentric around the spindle. Edges, particularly on the bed, will remain sharp and not be buffed away. It is a known fact that the poorest tools are always the shiniest and have the fewest sharp corners. They are buffed until they glisten, with little attempt to preserve the accuracy of working surfaces.

When speaking of tools, it is most appropriate to paraphrase the well known quotation, "No matter how well something is made, some one always finds a way to make it a little cheaper and a little worse."



Your Questions Answered Here!

By "THE PROFESSOR"

EDITOR'S NOTE: *A nationally renowned professor—who prefers to remain anonymous—has consented to answer questions from our readers pertaining to the science of horology and its various practical applications in the field of watch repair. Simply address your questions to the editor, H. I. A. Journal, 921 State Life Building, Indianapolis 4, Indiana. It will be our pleasant duty to forward all questions received to "The Professor" for a prompt reply and publishing in these columns every month.*

EDITOR'S NOTE — *The unusual question sent in by F. W. Jr. is so unique and of such historical importance as to challenge the ability of the Professor to solve it that it merits sufficient space in the H. I. A. JOURNAL for a detailed explanation.*

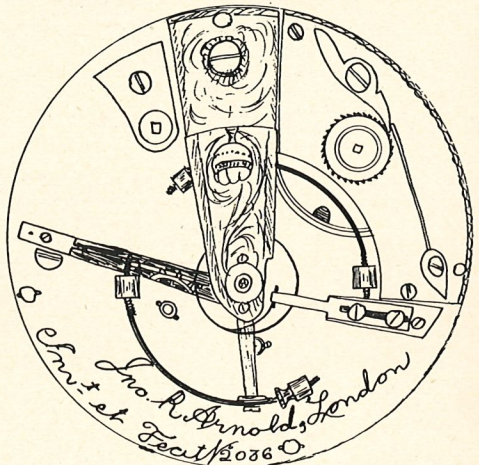
In his more than forty years contacts with great watch collections and thousands of rare watches, F. W. Jr.'s watch was the first of its kind to come to the "Professor's" attention.

The "Professor" spent hours diligently searching through his large and valuable horological library before the solution was found.

Dear "Professor":

I have recently acquired a pocket chronometer signed "Jno. R. Arnold, London, Inv't et fecit" No. 2036. This instrument is a gilt, 23 size full plate fuzee movement with Arnold's detent escapement and a helical balance spring with five coils. There is no regulator. The train beats 19,200 per hour by actual count. There are no unusual constructional features other than the balance and hairspring except the plain severity of the finish, in contrast to the usual work of this period. The balance and hairspring are of very peculiar construction. (See sketch). The balance rim is made of some grey-white metal, seems non-magnetic, and tests in varying temperatures seem to show a remarkably good compensation. I am very much interested in obtaining the following information:

1. Whether in your opinion this watch could be the product of John Arnold Sr. or of his son, John Roger Arnold. Arnold Senior was the inventor of the helical balance spring and this variety of the detent escapement. The words "Inv't et fecit" would seem to prove this as his work as the son would hardly claim the father's



PLAN OF TOP PLATE SHOWING BALANCE.

invention as his own. On the other hand Arnold Junior and E. J. Dent in 1830-1840 spent much time in research on non-magnetic compensating balances and this may be one of their experimental efforts. I should appreciate your opinion.

Second: The construction of the balance and spring. What sort of metal, the theoretical reasons behind making a balance of this construction and so on.

Third: The balance spring. Why should a balance spring be designed to work under a constant tension as this seems to be? Does a modern chronometer spring have to fulfill this condition? Any information on this subject will be most gratefully received.

I also have a Charles Frodsham watch marked "Arnold" on its dial and apparently one produced soon after Frodsham

took over Arnold's business after his death. This watch has a cryptographical date: A.D.F.M.S.Z. Can you solve this riddle for me?

Thank you very sincerely for any information you can give on the above topics.

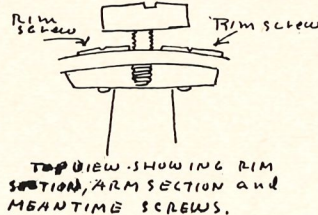
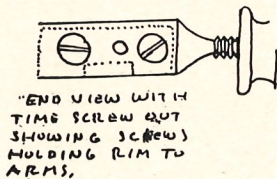
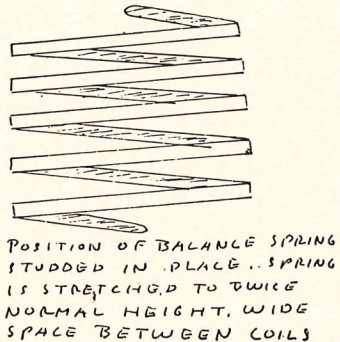
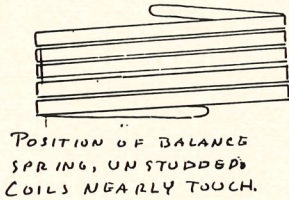
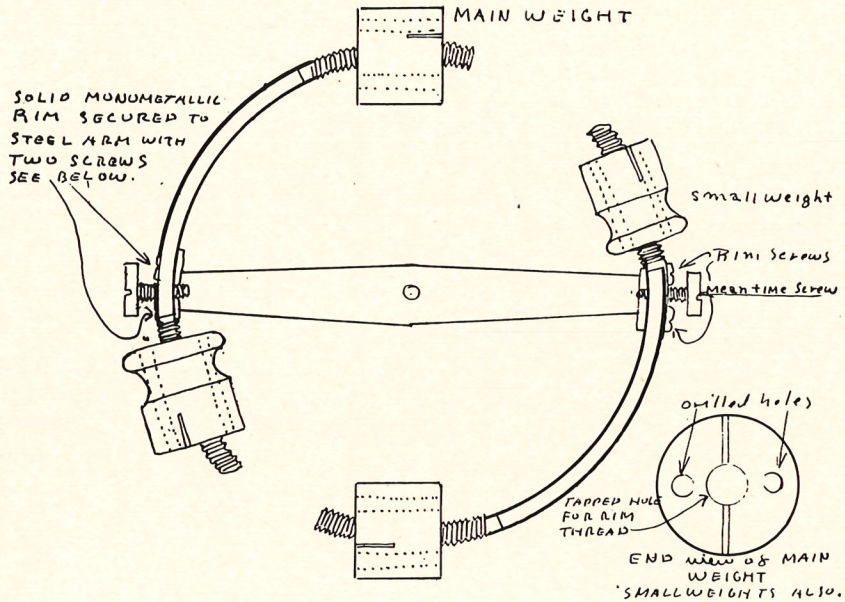
Very truly yours,

F. L. JR.

Answer:

Your letter of June 3, with sketches of an old pocket chronometer, poses some interesting questions, which we shall answer in the order in which they are asked in the letter.

(1) The maker of your timepiece was John Roger Arnold, the son of John Arnold



the great horologist and contemporary of Thomas Earnshaw, whose inventions together gave the world the marine chronometer largely as it is today. The words: "Inv't. et fecit" on the movement did apply more truly to the work of John Arnold, Senior; but their use by his son is just an example of stretching somewhat the principle of acquisition of "good-will" and trademarks, along with other assets, by the new owner and successor of a well-established business. John Arnold's son was not an inventor of anything worth noting in horology; he was not even a good workman or businessman, and what business he got was due altogether to his father's prestige at first, and later to the excellent work of his partners. In 1787, his father took him into the firm to be known as John Arnold & Son; from his father's death in 1799 until 1830, the firm name was John R. Arnold; from 1830 until 1840, it was Arnold & Dent, by partnership with Edward John Dent, who next set up his own shop in 1840, and became a famous horologist; from 1840, John R. Arnold did business again in his own name until his death in 1843. Your chronometer was made during this latest period, between 1840 and 1843. In the latter year, the Arnold business was bought over by Charles Frodsham, who signed his earlier work Arnold & Frodsham.

(2) The oddity of a balance with seemingly monometallic rim-segments, but which you found does actually compensate for the temperature effects on the steel hairspring, is explained as follows: John Arnold Senior sought to produce a non-magnetic balance, and made many experiments toward this between 1790 and the time of his death in 1799. After Edward Dent joined John Roger Arnold in 1830, the experiments were resumed, and finally arrived at a balance of the form that is in your watch. In it, the cross bar is of platinum, for its non-magnetic property; and the segments of the rim are *bi-metallic*, of platinum and silver, together having the

gray-white appearance that led you to conclude that the rim is monometallic. This balance was non-magnetic, and did compensate; but the platinum parts were not as stable and rigid as if made of steel; and the balance was more costly to make; so that it never became established in use.

(3) Concerning the balance spring and the closeness of the edges of its coils to each other when the spring is unpinned and free, although they separate decidedly when the spring is pinned up into collet and stud—this was "planned that way" by John Arnold Senior.

(4) The code used by Charles Frodsham in inscribing a date on some of his watches, was formed of the letters of his name as follows:

F R O D S H A M Z
1 2 3 4 5 6 7 8 9

So the cipher engraved on your Frodsham watch is solved: "A. D. 1859." This, however, was not meant to stand for the date when the watch was made; it appears on Frodsham watches that were made in different years. In 1859, James Ferguson Cole Sr., designed a new line of watches for Frodsham, who in a commemorative sense, had the year noted on his watches of that design, in the whimsical cipher form that so often puzzles watch collectors when they run across one of these Frodsham pieces.

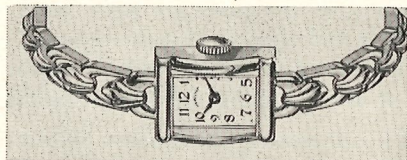
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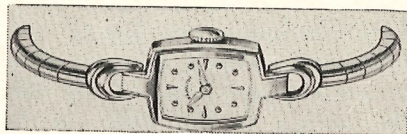
HAMILTON RESTYLES "FIRST LADY" WATCHES



A welcome addition to any woman's "watch-robe" is the FL-34, one of Hamilton's new First Lady watches. The FL-34 features a 14K gold sculptured link bracelet to match the lugs of the watch. The tax included price of the FL-34 is \$175.00.

The Hamilton Watch Company has announced the complete restyling of "First Lady" watch series to meet the demands on modern fashion-wise women. Richly wrought in extra heavy 14K gold, with silver dials, they blend beautifully with the entire ensemble.

With the exception of three cord models, each watch is fitted with custom-made 14K gold bracelet. Within this distinguished setting is Hamilton's 17-jewel 911M movement, bearing a tiny gold medallion of Hamilton craftsmen.

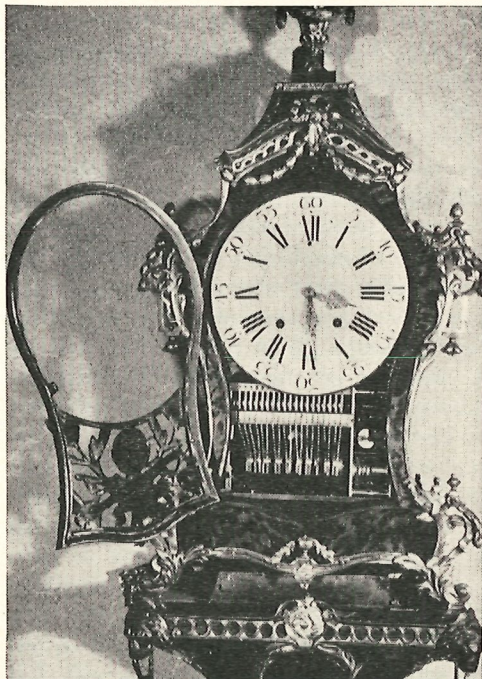


One of the new stars in the Hamilton First Lady series is the FL-32. This model features a modern 18K gold dot and marker dial with 14K gold case and custom designed bracelet. The FL-32 is priced at \$150.00 including federal tax.

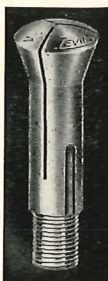
The new "First Lady" series consists of twelve artistically designed models. Each model has a silver dial with either black or applied gold numerals and markers, thus lending a touch of color to Milady's new fall wardrobe.

The 14K gold bracelets are fashioned in single and double snake chains, and sculptured and lapped link designs.

Hamilton has scheduled special fall advertising of the "First Lady" series, as well as Lady Lancaster and Lady Hamilton diamond watches.



Regence clock in wooden case, with four-quarter chimes, signed "Fonck in Berne." Fonck is the equivalent of the Germanic name, Funk, who was the best-known cabinet maker in the 18th century in Switzerland. His son made clock movements.



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Type WW Wire Chucks 5 mm capacity always in stock at leading material dealers.

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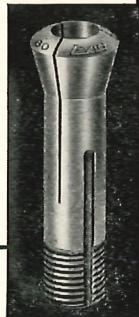
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Type D Wire Chucks 8 mm capacity.

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No. 2	7.20
No. 2½	6.00
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A Training Program for Apprenticed Watchmakers

EDITOR'S NOTE: *Those apprentices who expect to find satisfactory repairing and servicing of timepieces an easy profession to master are doomed to disappointment and unless this erroneous impression is corrected they will find themselves in the "Tinker" classification. It requires little skill or training to make a timepiece "tick"; but to make it "keep time" requires knowledge and skill. Successful servicing and repairing timepieces requires unusual mechanical aptitude; a thorough understanding of the theory of horology and its practical applications; long and exacting training in the skillful application of the various tools and equipment of the profession, before one is capable of satisfactorily restoring timepieces to their original time-keeping condition.*

INSPECTION OF BALANCE CAP OR ENDSTONES AND HOLE JEWELS

1. CAP OR ENDSTONES

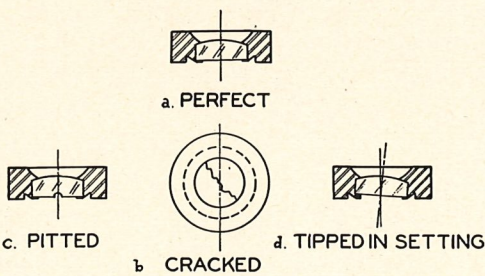


Fig. 1

- (a) Clean thoroughly the cap or endstone.
- (b) Inspect for fractures and "pits" where end of pivot contacts cap or endstones in Dial up and Dial down positions.
- (c) Check thoroughly the horizontal (flat) setting of the cap or endstone in setting. If jewel is not set "flat" in the settings a variation in the rate of the watch in dial up and/or dial down position will result.

2. BALANCE HOLE JEWELS

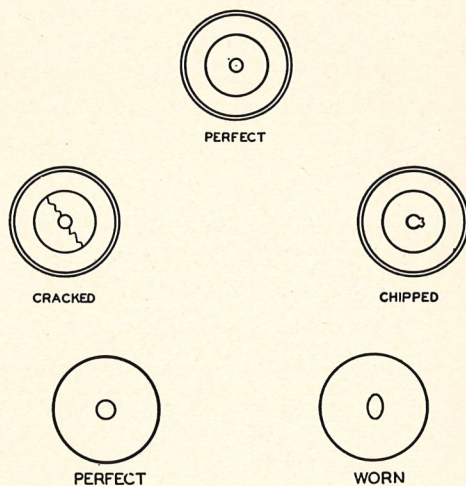


Fig. 2

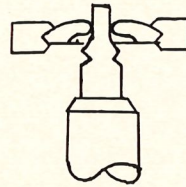
- (a) Clean thoroughly.
- (b) Check for "flatness" of jewel in setting. If not "flat" will cause reduced side shape on pivot and in extreme cases the pivot will "bind" in the jewel hole.
- (c) Inspect for fractures.
- (d) Condition of jewel holes.
- (e) Balance hole centered.

3. ASSEMBLY OF CAP OR ENDSTONE AND BALANCE HOLE JEWELS

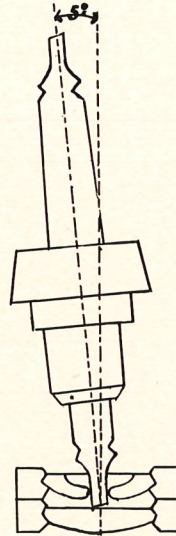
- (a) See that the balance jewel setting or flanges or shoulders are free from foreign matter. The presence of lint or dust may cause the jewel setting to seat "out of flat."
- (b) Check your jewel setting diameter "fit" in upper and lower jewel recesses. The settings should be "forced" fit. This will eliminate any off center positioning of the jewel hole which is possible in a hole jewel where the diameter of the setting is too small.
- (c) Place jewel setting firmly against seat flange with a "jewel-pusher." Be sure that the jewel setting is "contacting" seat flanges or "shoulders" at all points. This will prevent an "out of flat" condition described in 2 (b).

4. FITTING BALANCE JEWEL TO PIVOTS

- (a) In general practice, a satisfactory rule for selecting the proper size balance jewel hole is—place proper diameter "set" jewel on balance pivot, until the jewel hole "binds" on the cone of the pivot. If the pivot extends beyond the top of



a



b

the jewel, twice the length of the diameter of the pivot, less the thickness of the jewel at the hole, you can be assured that the jewel hole will provide the proper "side shake."

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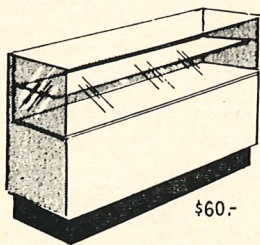
(b) When fitting the staff to the hole jewel where the end stone or cap jewel and the balance hole jewel are assembled, place the pivot into the hole and if the balance staff "leans" 5 degrees out of perpendicular you can safely assume that the pivot is correct for proper "side shake." If the staff "leans" more than 5 degrees off perpendicular,

the pivot is too small and will create too much side shake. If the staff "leans" less than 5 degrees from perpendicular, you can assume that the pivot is too large and should be changed to a smaller size pivot or reduced in diameter sufficient to cause the balance staff to "lean" the 5 degrees off perpendicular.

MAY (1949) GRADUATING CLASS OF THE TERRE HAUTE SCHOOL OF WATCHMAKING
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1 John Doyle, 2 George Crawford, 3 Eugene Oswald, 4 Sheldon Clements, 5 Clarence Dougherty, 6 Harold Koob, 7 James Yates, 8 Milton Sloan, 9 Donald Lentz, 10 Otho Meazel, 11 George Burrows, 12 Cecil Stogsdill, 13 Robert Herm, 14 Archie Brown, 15 Louis Croft, 16 Lawrence Rademacher, 17 Paul Douglas, 18 Emerson Bixler, 19 Loren Holdaway, 20 Pat Ingles, 21 Charles Robertson, 22 Harold Greenwood, 23 Harold Walters.



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Albert G. Craig, of Bicknell, Ind., has had almost threescore years of service as an active watchmaker—fifty-nine years, to be exact—thus qualifying as a Half-Century Club member.

Mr. Craig was born at Otwell, Ind., in 1874, and he began watch repairing in 1896 at the age of 16 years. He did local work until 1901, when he established his own repair shop in Winslow, Ind., continuing there until 1904. Then he moved his shop to Bicknell, Ind., opening up the first jewelry shop there. He has been established in Bicknell for the past forty-five years.

During this period of forty-five years, Mr. Craig has seen the population of Bicknell increase from 1,800 to approximately 6,500 at the present time.

Mr. Craig has prospered and now owns the business block in which his store is located.

Now in his 76th year, he plans an early retirement from business and hopes to spend his "evening of life" with Mrs. Craig in southern California.

"CONGRATULATIONS, Mr. Craig . . .!"



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HOW TO INVITE A DEPRESSION

A man lived by the side of the road and sold hot dogs. He was hard of hearing, so he had no radio. He had trouble with his eyes, so he read no newspapers. But he sold good hot dogs.

He put up signs on the highway telling how good they were. He stood by the side of the road and cried, "Buy a hot dog, Mister." And people bought.

He increased his meat and bun orders. He bought a bigger stove to take care of his trade. He got his son home from college to help him.

But then something happened . . .

His son said, "Father, haven't you been listening to the radio? There's a big depression on. The European situation is terrible. The Domestic situation is worse."

Whereupon the father thought, "Well, my son's been to college. He reads the papers and he listens to the radio and he ought to know."

So the father cut down on his meat and bun orders. Took down his advertising signs, and no longer bothered to stand out on the highway to sell hot dogs. And his hot dog sales fell almost overnight.

"You're right son," the father said to the boy. "We certainly are in the middle of a great depression."

DEAN'S WATCH MATERIALS AND TOOLS

MAIL ORDER HOUSE

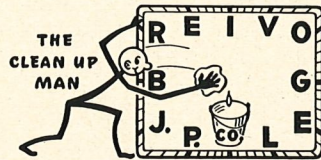
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Dan's been making new dials out of old ones at our place for 30 years or more. We keep him on because he has a habit of making friends—thousands of them—who'd swear on a stack of pocket watches that Dan consistently turns out the finest dial-refinishing jobs they ever saw. Every dial that Dan refinishes gets our exclusive PERM-ENAM treatment, the original dial-enameling process. Every dial job is guaranteed against tarnishing for ONE YEAR.

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Nine months Graduate Watchmaking Course. Your career is assured when you have been certified by the Horological Institute of America, Washington, D. C. . . . Approved for Veterans

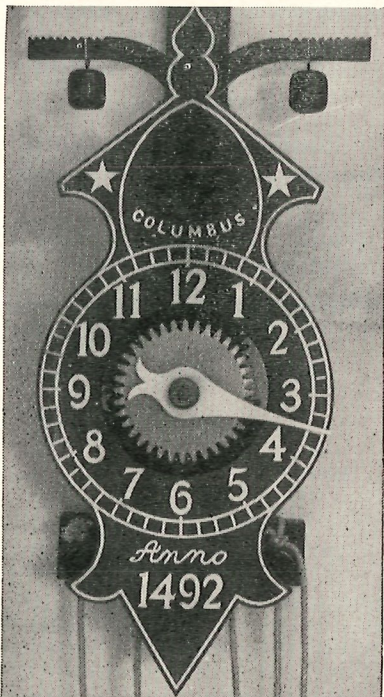
HOUSTON TECHNICAL COLLEGE

1009 WAUGH DRIVE

Dept. "H"

HOUSTON, TEXAS

Watchmaking Student Makes "Columbus Clock"



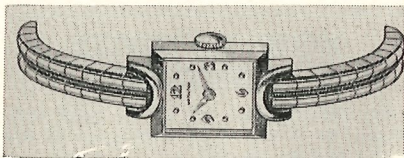
"Columbus" Chuck model, built by George Craft, student Elgin Watchmakers College. This model is 15 inches high. Dial, hands and wheels are wood.

The clock (shown above) is a replica of "The Columbus Clock," a foliot type clock, originally introduced by Henry De Vick of Wertenburg, Germany, in the 14th century. This clock was built by George Craft, a student of the Elgin Watchmakers College. Mr. Craft's model is 15 inches high.

The dial, hands and wheels are of wood. It is weight driven and will run 30 hours on one winding.

During the World's Columbian Exposition, held in Chicago in 1892-93, a large number of these wooden foliot type clocks were manufactured by an Ohio novelty concern as a commemorative souvenir of the Exposition. Occasionally one is "discovered" in an old attic and the finders believe they have found an authentic "antique" timepiece.

These "Columbus Clocks" have little, if any, value as "collector's items."



The FL-37, one of the models in Hamilton's new First Lady series, is a striking example of modern watch styling. A smartly styled case, 18K gold numeral and dot dial, and a heavy 14K gold bracelet all combine to make the FL-37 an outstanding fashion watch. The FL-37 is priced at \$200.00 tax included.

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Esembl-O-Graf

Every watchmaker, every jeweler has a real stake in the revolutionary new ESEMBL-O-GRAF method of servicing chronographs. The popular market for complicated movements has grown and will continue to grow to such an extent that the average watchmaker can no longer ignore it . . . nor will he want to.

Chronograph repair by the ESEMBL-O-GRAF method is a PROFITABLE undertaking. Finishing a job in only a fraction of the time formerly required, the watchmaker can realize a far greater return for his services. Similarly, many watchmakers whose crowded schedules have not permitted chronograph repair at ANY price can now take on this profitable activity without slighting their regular watch repair business. Jewelry department traffic is thereby increased.

As a dependable, fool-proof technique, the ESEMBL-O-GRAF method is a valuable prestige builder. Every customer for whom a chronograph is serviced quickly and satisfactorily becomes a walking, talking billboard for the watchmaker and the jeweler.

Put ESEMBL-O-GRAF profits in your watch repair department now. Inquiries answered in detail.

Esembl-O-Graf

Desk 4, 807 Ridge Ave.

Pittsburgh 12, Pa.

The Esembl-O-Graf method of chronograph repair is currently taught at Western Pennsylvania Horological Institute, Pittsburgh, Pa.

Rockwell Painting to Be Featured in "Watch Inspection Time" Advertising



WHAT MAKES IT TICK?

A Norman Rockwell painting will be featured in full-color page advertisements by the Watchmakers of Switzerland, and also used in window display material for retail jewelers during "Watch Inspection Time," Sept. 12-17.

The magazine advertisement, headlined, "What Makes it Tick?," shows a small boy gazing raptly at a veteran watchmaker working at a typical watchmaker's bench. Critics have acclaimed the Rockwell painting as one of the finest pieces of art work ever dedicated to the watchmaking industry.

The "copy" in the advertisement points out to the customer the necessity of having a fine watch cared for by a reputable jeweler and his "repair craftsmen."

Jewelers will be offered a special four-piece "Watch Inspection Time" window display, featuring the full-color reproduction of the Rockwell painting as a centerpiece. This easel-mounted picture has a simulated three-dimensional oak frame and carries no advertising.

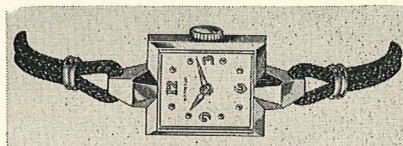
The small easels are also furnished with the display, one, showing a diagram of a quantity jeweled-lever Swiss watch move-

ment, is headlined: "Has your watch been checked lately?"; the other, illustrated with two drawings of a jeweled-lever escapement and also a cheap watch escapement, is headlined "Ask about the difference."

An idea booklet on "Watch Inspection Time," Radio "spots," ad copy and direct mail advertising is also available to jewelers and watchmakers.

CORRECTION PLEASE (It must be the Heat)

- 1—Page 40—JULY issue, top right column, CHAPLIN RECEIVES GIFT—last line should read: "And the WATCHMAKERS OF SWITZERLAND."
- 2—Page 42—Upper left—CUT should have been reversed.
- 3—Page 50—Upper left—Should read: "C. & E. MARSHALL COMPANY HOST AT CONVENTION."



Lasting beauty is the keynote of the entire Hamilton First Lady series, but the severe lines of the FL-31 make it an exceptionally smart timepiece to be worn on any occasion with any ensemble. The price of the FL-31 is \$110.00 tax included.

3RD EDITION WATCH ESCAPEMENTS BY DR. PELLATON NOW AVAILABLE

The third edition of watch escapements by Dr. James C. Pelton, former Director of the School of Horology, LeLocle Technicum Neuchatelais, English translation by S. Paris, edited by Donald de Carle, and illustrated by Edward H. Price—is now available through Henry Paulson & Co., 131 South Wabash Ave., Chicago 3, Illinois, sales distributors for the United States.

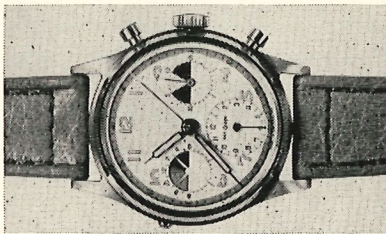
This third edition contains 125 pages of instructive matter supplemented with 275 line drawings. Eighteen pages are devoted to pivoted and spring detent chronometer escapements. It retails for \$3.50.

NEW AUTOMATIC WATCH CLEANING MACHINE



The L & R Manufacturing Company of Arlington, N. J., has introduced on the market its new automatic watch cleaning machine. Its action is completely automatic, through the cleaning, rinsing, second rinsing and drying cycle of only twelve minutes.

The engineers designed the new cleaning machine have provided hydraulic and mechanical operation for smooth, easy action. The new automatic reversing motor produces maximum efficiency by continu-



PERFECT TIME-TELLING TIMEPIECE

Newest development in Swiss watches with jeweled-lever movements to be produced by master craftsmen in Switzerland, is this "marine watch," shown above, a quality timepiece embodying chronograph features which tells the time daily when high and low tides occur in a given port.

ous reversing of the cleaning baskets. A one-direction spin-off is automatically controlled, assuring ultimate cleaning results and keeps solutions in better condition for longer periods of time.

In the drying chamber of the new cleaning machine, there is a controlled one-direction rotation, with drying results heightened by a motor-driven fan. The rotating basket eliminates "air pockets" which causes stains and spots on watch parts.

The new L & R automatic watch cleaning machine is available through watch material jobbers from coast to coast.

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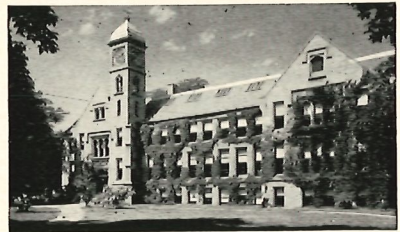
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Horology Division

Department I, Peoria, Illinois

45 COMPLETE COURSE IN CHRONOGRAPH REPAIRING

WORLD'S FIRST CHRONOGRAPH TECHNICIAN GRADUATES USING FAMOUS "ESEMBL-O-GRAF" METHOD OF CHRONOGRAF REPAIR, AT COMMENCEMENT EXERCISES, ROOSEVELT HOTEL, PITTSBURGH, PA. JUNE 20, 1949.



Left to right first row: Joseph DeLuca, Albert J. Yonick, Andrew Cesnick, Wesley Lenusky, Carlo P. Petrilli, Orville G. Willhide, Bernard W. Smith, Sylvester A. Eckert, George C. Bergman, Richard D. Johnson and Harold D. Craft, instructor. Second row: John E. Weaver, Carl F. DiSimo, Cyril O. Gotschall, Arthur E. Campbell, John F. Witt, Eugene A. Fischione, Michael A. Ennarino, Alfred C. Chierieleison, Thomas McDonald, Joseph S. Harcina, William Cole, instructor; William A. Kennavan, instructor; Wm. O. Smith, Jr., chief technician, and Wm. O. Smith, Sr., president, W. P. H. I. Third row: Sterling E. Walters, Earl R. Knight, Joseph R. Speranzo, James F. Riley, Amos H. Hughes, Jr., Edward F. Fitzroy, John J. Bauer, John B. Sanga, Nick Marvich, Louis L. Wittman, Adolph DeQuinze, Francis Derinti and Reid Turner, instructor. (Note packages of "ESEMBL-O-GRAFS" received.)

ANTI-RUST HAND SOAP BOON TO WATCHMAKERS



Wash the hands twice daily, using this soap, and they will remain free from perspiration. Consequently, tools and watch parts will not be exposed to rust caused by perspiration from the hands. And too, there is much comfort gained when one is free from "sweaty hands."

Anti-rust hand soap has been in use for years in Swiss watch factories and was introduced and sold widely in this country by Swartchild & Co., before the war.

It is now again available and is made exclusively for Swartchild & Co. by the same chemist in Switzerland. Their ad on page 14 contains complete information.

Watch Material Distributors Held Successful Meeting

The conference meeting of the newly-formed Watch Material Distributors Association of America, held at Chicago June 6-7 was most successful in point of interest and attendance. This association now has an active membership of 123, and is a truly representative "group" of watch material, tool and jewelers supply houses in America.

Action was taken at this meeting to standardize material assortment cabinets, filing systems, refill envelopes and "tracer cards," salesmen compensation, insurance coverage and the general use of the organization's official emblem.

Under the efficient direction of H. Donald Richards, executive secretary, many essential services are now available to members of the association.

Indiana Watchmakers Held Successful Annual Meeting



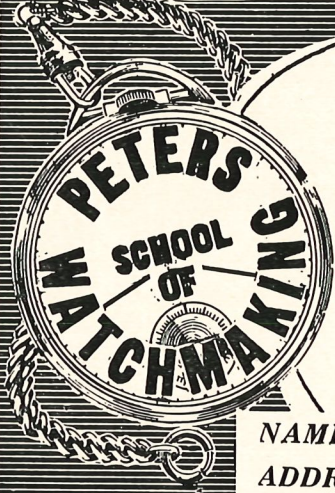
Paul R. Sheddric

The Watchmakers Association of Indiana held a successful annual meeting in Indianapolis in the Antlers Hotel, on Sun-

day, June 26, bringing together more than 400 watchmakers and guests. It was the sixteenth annual meeting of the Association.

Paul R. Sheddric of Middletown, was elected president, succeeding T. S. Banta of Waveland; Richard Osborn of Bloomington, was elected vice-president; Harold K. Calvert of Indianapolis, was re-elected secretary-treasurer and managing director. J. Hershell Monroe of Princeton, was elected as a director of the Association, replacing Herman L. Lodde of New Albany.

Speakers on the convention program were: George Sims, Jr. of Terre Haute, president of the Terre Haute School of Watchmaking; Clif M. Rigsbee of Indianapolis, assistant in charge of timing and scoring of the Indianapolis Motor Speedway; Henry B. Fried of New York, executive secretary of the Horological Society of New York and lecturer and instructor of the George Westinghouse Vocational High School of Brooklyn, N. Y.; Carl Campbell of Chicago, planning engineer of the C & E Marshall Company; Dr. A. B. Carlisle of Indianapolis, professor of education of Butler University; Dick Slaugh of Lancaster, Pa., head watchmaker of Hamilton Watch Company; and Wil-

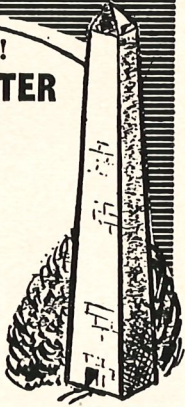


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liam Pillath, Jr. of Chicago.

William "Uncle Billy" Samelius, dean of the Elgin Watchmakers College of Elgin, Ill., was given an ovation at the convention, and responded briefly. Special tribute was paid to Marcus Furstenburg of Indianapolis, first president of the Association, and H. W. Schaefer of Indianapolis, first secretary-treasurer.

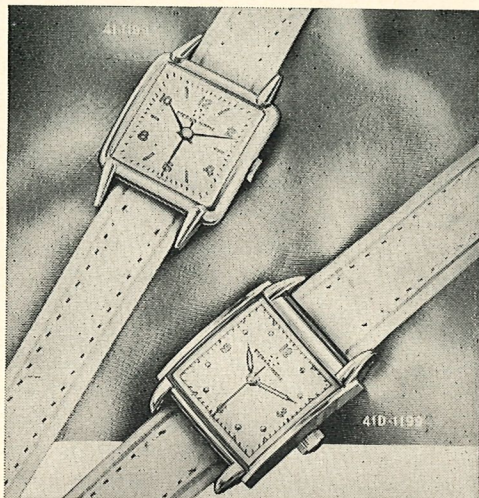
In his presidential message, retiring President Banta pointed out that much progress has been made in Indiana watchmaking since the formation of the Association in 1933. Prior to that time, he declared "gyp artists" and "alley mechanics" had gouged and cheated the public in Indiana. The enactment of the Indiana watchmakers law, he asserted, had restored confidence in ethical watchmaking in Hoosierdom.

The Indiana Association, one of the most progressive and largest state organizations in the nation, has a paidup membership of approximately 450 members, Secretary-Treasurer Calvert reported.

The beautiful Gold Room in the Antlers Hotel scarcely was able to seat the Hoosier watchmakers and their wives at the Sunday noon luncheon, which luncheon was served to members without cost. More than fifty attendance prizes were awarded, following the luncheon meeting.

In spite of the torrid summer temperature at the convention, it proved to be one of the "peppiest" ever held in the history of the Association. A vote was taken, however, to hold the annual meeting at either an earlier or later date than June.

MEN'S ETERNA-MATIC AVAILABLE SEPT. 1



The above men's ETERNA-MATIC watches are cased in water-resistant, stainless steel cases and are the smallest made in automatic wind watches. The dial openings are approximately the size of a quarter. These watches retail for \$71.50 tax included.

The first normal-sized square self-winding wrist watch for men, the Eterna-Matic, will be introduced to the American market September 1 by the Eterna Watch Company of Switzerland, according to Pierre Bohy, vice-president of the company and U. S. sales manager. Like its lady's counterpart, introduced in July, the Eterna-Matic is based on a revolutionary principle—it's the first man's automatic that winds itself on a ball bearing.

All previous men's square automatic watches have been over-sized because of the special mechanism required for self-winding. The face of the new Eterna-Matic is about the size of a quarter, comparing width with diameter.

It will be available in four square models: stainless steel, 14K gold-filled, 14K and 18K gold, in waterproof and standard cases.

Mr. Bohy pointed out that the man's Eterna-Matic, like the lady's, is protected against dust, shock and magnetism by patented devices. It maintains a steady performance, since the mainspring is always in the same state of tension — constantly wound up.

Bestfit

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- FOR PROTECTED QUALITY
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MINUTE $\frac{1}{12}$
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Genuine
6C INDEX
HAND
REFILLS

How to Make a Repair Department Pay

By

Business Engineering Division, C. & E. Marshall Company

The Bureau of economic and business research of the University of Illinois, in their report on the Operating Results of Retail Jewelry Stores, states that the repair work should yield at least the average profit even in the smallest stores. To some this may seem to be an amazing statement. Actually it is not. This profit objective is within the immediate reach of everyone. Helping you reach this objective is the job and duty of the Marshall Engineers. Advising you correctly, on all matters, is our foremost duty to you. To recognize the jewelers and the watchmakers' particular problems, a course in the fundamentals of watchmaking must be completed prior to the engineer doing any field work. Nor does the engineer's training stop there. Products of all manufacturers are examined and notes made on the performance of each one.

When all of this information is accumulated and analyzed, we are sent into the industry to report our findings. In other words, call the balls and strikes as we see them. We are in complete agreement with the statement made by the University of Illinois to the effect that your Watch Repair Department should realize at least the average profit of your organization. We

believe that the watch repair department is the most important department in your business because not only will it realize the average profit, but it brings the public in to your stores, who at a later date will return to buy their diamonds. The University of Illinois report bears this assertion out with their statement that an analysis of the 14 most profitable stores shows that the repair work averages a higher proportion of sales than in the other stores. Therefore, as the future of your business depends on this department, its profitable operation is of vital importance to all.

The success formula today is high quality work at a price that the public will pay. Your customers have placed a ceiling on the price of watch repairs. If you doubt this, consider a remark that is heard every day at your repair counter: "My watch has stopped. How much will it cost to get it fixed?" As you no longer can raise prices to insure more profit, the only alternative is more efficient operation of your repair department. An efficiently operated repair department will enable you to actually lower prices, and still retain the desired margin of profit in your business. With lower prices and the same high quality of work,

"A Government Approved Watchmakers' School"

Terre Haute School of Watchmaking gives *individualized* instruction in a government approved training program for 200 students. Master watch and clock craftsmen make up the faculty. In an 18-months' course, YOU can pass the state examinations.

Write for information folder

Terre Haute School of Watchmaking

Terre Haute, Ind.

additional sales will follow as a matter of course.

It is a trade practice to establish prices in direct relation to the Jones'es prices without any thought concerning the thought of operating your own shop. If the methods of your neighbors are not efficient, your prices are too high, because it was necessary to increase prices to overcome inefficiency. On the other hand, prices may be too low for you to realize a profit. Without a scientific method of calculating prices, based on your shop conditions, you do not know what price should be charged for each type of job in order to insure a profit.

Repair prices must recover the cost of direct labor, material, overhead and a fair net profit. Thus, to calculate the selling price of any repair, the time required to do that type of work must be determined. The cost of the labor applicable is obtained by . . . multiplying the time required to do the job by the rate per hour paid your watchmakers. To the labor cost is **ADDED** the material cost and the overhead. This represents total cost of the repair, and by adding the desired profit, the selling price is the result. A **CHART** of prices is usually available for customer inspection, thus indicating fairness.

Establishing scientific selling prices is a complex problem, which we are happy to help you with if you will write us, care of Business Engineering Department, C. & E. Marshall Company, in Chicago.

When you have arrived at the price you must charge for each type of job in order to operate at a profit, you are then ready to compare prices with your neighbor. In some cases prices have been too high to be acceptable, and in other cases the prices were much less than the average charged in the locality. If the prices are less, the savings that are effected can be given to the customer. If your prices are higher than your competitors, you probably must accept their prices, but you have the facts necessary to immediately drive for efficiency in your repair department.

Your watch material systems are the focal point of an efficiently-operated repair department. This is an unusual statement because the material cost in each watch repair is a very minor item. In fact, it usually is the least important item as it usually costs a few cents. This is the ideal situation, but often we find that the labor cost attached thereto is so excessive that a profit is absolutely impossible. This is brought about by inadequate material systems that are filled with duplicate stocks, and through the use of small bulk assortments.

Consider this example: A watchmaker is looking for an item of material which costs in the neighborhood of twenty-five cents. The material is filed by model of watch, with no recognition of the interchangeability, therefore the material compartment for the repair on hand is empty. There may be a hundred of this particular part stocked, but without a cross reference chart, the watchmaker has no way of finding it. At this point ten minutes has been spent looking for material. The watchmaker now takes the "thousand to one chance" that he can find the particular piece of material in a bulk assortment. It is not unusual for the watchmaker to spend an hour looking through the assortment, and he is fortunate if, at the end of the hour and ten minutes, a piece of material can be found that is close enough to specifications for the watchmaker to alter and thus make it do.

If, at the end of an hour and ten minutes a piece of material is found that can be altered by the watchmaker, the altering time may require a half an hour . . . your investment in this repair is now one hour and forty minutes . . . and the watchmaker has not started to work. If it is a staff and overhaul for an average grade of commercial watch, it will take him an hour and a half of actual working time. This repair has more than three hours of time invested in it. It is a dead loss, and all because twenty-five cents worth of material was not available, or could not be found.

This brings us to the conclusion that it

is not the cost of the material that is most important, but the waste of human effort which arises whenever improper systems are used. This hidden cost exceeds the average price of the material by approximately five to one. This means that any repair does not go through in a production run, is leaving your store at a loss. Each time your watchmakers look into an assortment, or alters a part, the labor cost is approximately five to one more than the value of the material.

The solution is to give your watchmakers material systems that are constructed from sales records. Thus, what other jewelers are buying, you are stocking, and your coverage will average 90 to 95% on the average grade of commercial watches.

You have the problem of keeping down your investment in material systems and yet have adequate coverage. This can be done best by installing systems that eliminate duplicate stocks of material that are interchangeable. As material should be stocked in just one place, the systems should have an interchangeable part chart, thus indicating the parts that are identical and the stocking location.

The new Swiss Program will change your stocking material methods from the bottle or compartment, to the envelope method. This really is very good for you as it gives you a more efficient method of stocking. Our material envelopes are ruled to record the date of receipt of material. By reference to this date, the rate of usage can be determined. With these facts before you, you can order material in the quantity necessary to obtain the best prices available and yet keep your material investment to the minimum. Since new envelopes are sent with each order, these systems are always neat and clean. The envelope slips right into the system in the same way as a letter into a letter file. You have room for additional material as there are no compartments to move about.

The cost of material systems run approxi-

mately 35% less than the value of the material contained in them. This is due to using production methods in constructing them, and the savings are passed on to you.

We have jewelers operating with material cost as low as 7.5% of sales. This is due to maintaining the material controls possible with the envelope method of stocking. Purchases are made in the quantities necessary to obtain the quantity price, and as the usage rate is a matter of record, slow moving parts are purchased in small quantities.

Investment in material systems should be regarded as a permanent investment exactly like your office furniture. They are permanent assets needed to conduct business, and as such should be reflected in your records.

In order to prevent distortion of the amount of your monthly purchases of refills, it is recommended that two accounts be kept. One for the purchase of systems and one for the purchase of refill material. The money expended for refills is immediately available for comparison in percentage to the sales.

The high quality of the material contained in the systems is due to the large staff of highly trained technicians, that examine the material before it is sent on to you. In order to place the responsibility for the quality of the material contained in your systems, it is necessary to use one source of supply. When this is done there is never any doubt concerning the responsibility for errors, and their correction can be made immediately.

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SWISS BUREAU HEAD ADDRESSES RETAILERS

Paul A. Tschudin, director of the Swiss Watch Repair Parts Information Bureau, Inc., was principal speaker at the regular June meeting of the Westchester Retail Jewelers Association, held at White Plains, New York.

Mr. Tschudin discussed the background of the current advertising and merchandising program of The Watchmakers of Switzerland in this country, and explained how the Swiss Watch Repair Parts Program is aimed at not only simplifying bench repair problems but also increasing the watchmaker's profits.

The sound film, "Switzerland Today," was also shown to the large number of retailers present.

Mike Wilson, head of the association, presided.

Chicago Institute of Watchmaking

is pleased to announce a six months' course in Jewelry and Advanced Watch Repair.



A few benches are available in our regular course in watch repair.



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Complicated and Antique Watches
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ESTIMATES given on all jobs.

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LOST AND FOUND

LOST—The sale of a watch repair because you were unable to obtain the necessary part. Found, a complete supply house that specializes in "Hard-to-Get" watch parts. If you are having difficulty in obtaining a Swiss or American watch part, try JOHN A. POLTOCK & CO., 15 Maiden Lane, New York 7, N. Y. Write for FREE catalogue, ligne gauge and stationery.

COMPENSATION: Provision for making the timekeeping of balances or pendulums uniform during changes of atmospheric temperature in heat and cold.

The August Cover Story

Prior to the 17th century, Swiss watchmakers of Geneva did not "sign" their watches. In 1601 a watchmakers' guild was formed in Geneva, and for identification purposes, members were required to "signature" their work. However, as no place of origin was required, many 17th century Geneva-made watches have been credited to French origin. From documents in the State Archives of Geneva, it has been possible to trace some of the early Swiss watchmakers.

One of the earliest Swiss watchmakers to "sign" his watches was Martin Duboule, (1583-1639). Combining the goldsmith's art with the watchmaker's skill, his watches were, indeed, masterpieces. Our August cover illustration shows one of the watches signed by Duboule, now on exhibition in the Cluny Museum in Paris.

The case is in the form of a ten-

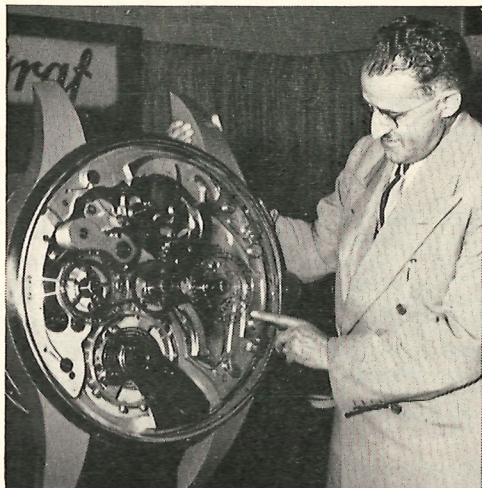
point chiseled and enameled star design. The background is black enamel. The flower work is partly red-enameled-translucent on tinsel, and partly in green enamel. A second plate protects the movement and must be lifted before the movement can be seen.

The upper and lower parts of the case are the same and are enameled on the inside.

The single hour-hand is mounted with three diamonds. The case is set with large triangle and rectangular cut diamonds.

This watch was made approximately between 1620-1630.

(This is the second of a series of cover illustrations of Antique Watches. The historical data was supplied by Prof. Eugene Jacquet, one of the world's outstanding horologists. Professor Jacquet is curator of the Geneva Watch Museum; President of the Swiss Chronometer Society; director and professor at the Geneva Watchmaking School for 30 years and professor of the renowned Bienne Technicum for five years.)



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