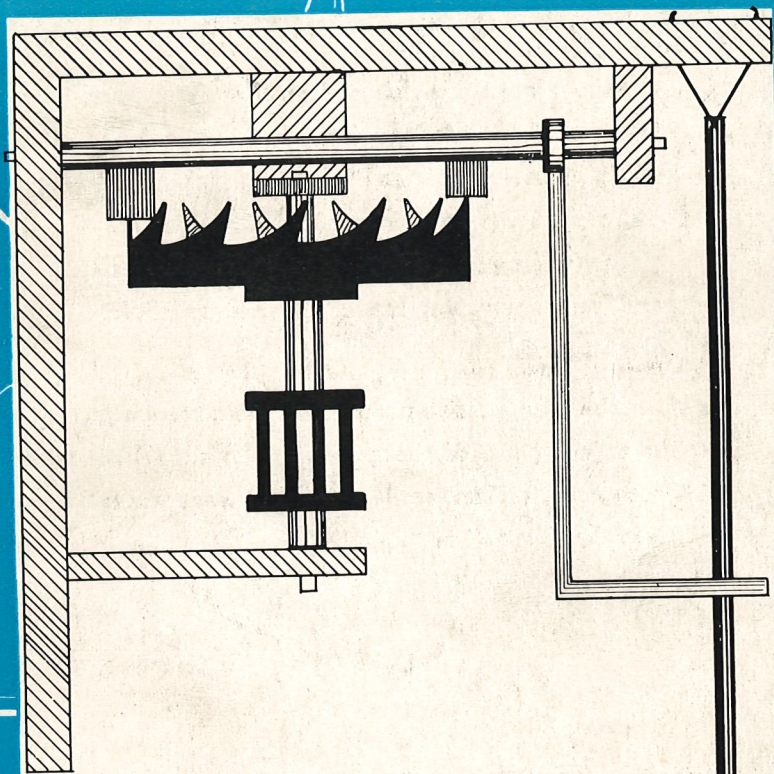


# The H.I.A. Journal

OFFICIAL PUBLICATION OF THE HOROLOGICAL INSTITUTE OF AMERICA



*HUYGENS.*

*FIRST PENDULUM 1657.*

JANUARY 1949

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## *The January Cover Story . . .*

The escapement, shown on the cover-page, is the first recorded application, to timepieces, of the principle of the "swinging pendulum", discovered by Galileo in 1681. Christian Huyghens (or Huygens), a famous Dutch astronomer and mathematician, made the first pendulum clock in 1657.

The escapement, pictured on the cover-page, is an adoption of the pendulum to the Foliot escapement. The earliest form of escapement was the "verge" or "spindle".

EDITOR'S NOTE: *We are indebted to Mr. William H. Samelius, dean of the Elgin Watchmakers College, for the original drawings which will appear in this series of cover page illustrations. The "running" models are on display in the Time Room of the Museum of Science and Industry, Fifty-seventh Street and South Shore Drive, Chicago, Illinois.*

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... Bulletin from The Watchmakers of Switzerland

# NEWS!

These 4 pages tell you about the huge new program sponsored by The Watchmakers of Switzerland — designed to promote the sales and servicing of watches in the U.S.A.

**NEWS! First, there's the great new Official Swiss Watch Repair Parts Program—which includes ...**

● The new Official Swiss Watch Repair Parts Information Bureau located at 730 Fifth Avenue, New York City, N. Y. Complete information service! The Bureau is NOT stocking parts, but we're ready to answer your questions and be of service to you.

● The new Official Catalogue of Swiss Watch Repair Parts (Part I). This 150 page looseleaf book has set into operation a new standardized system for identification and ordering of Swiss Watch Repair Parts. Revolutionary in its simplicity and accuracy! Place your parts orders

according to this new official system. If your watch repair department hasn't a copy, order one now from the Information Bureau.

● The new Official Dictionary of Watch Parts. A 167 page reference book that defines *all* parts of *all* Swiss Watches, and includes a picture of each part. See page four of this bulletin for a complete description and instructions for getting your copy.

● The new Official Parts Package will be gradually introduced this Spring. Swiss Watch Repair Parts for currently manufactured Ebauches movements shown in the new Catalogue (Part I) will then begin to come to you separately sealed in a foil package with identifying numbers. Meanwhile, you'll receive the same parts, but unpackaged.

*The entire Swiss Watch Repair Program has been endorsed by horological and major watch material distributor associations.*

**NEWS!** Turn the page for news of the great consumer campaign that week after

week reminds millions of customers ...

*No matter what the make of your watch, it can be serviced economically and promptly, thanks to the efficiency of the modern jeweler.*

The WATCHMAKERS OF



SWITZERLAND

... Bulletin from The Watchmakers of Switzerland

**NEWS!**

Here's your February Consumer ad... No. 10 in the great watch-selling consumer campaign sponsored by The **WATCHMAKERS OF SWITZERLAND.**

## February may be a **SHORT** month—but it can be **LONG** on Business!

**A**ND THE AD that you see on the opposite page will help to make *this* February the best one yet! More than 82,000,000 readers will see the February ad in their favorite magazines. And this is just *one* of a continuing series of ads designed to help you — the American jeweler.

Yes, this powerful campaign runs all year long! Because you're in business all year long—and because The

Watchmakers of Switzerland want this campaign to help increase your business in the sales and servicing of watches every month of the year!

That's why every ad in this series has the same two-fold purpose: to help you sell *more* watches throughout the year; and to remind your customers that a jewelry store is the logical place to purchase gifts of long remembrance.

*That's why every ad drives home this same slogan . . .*

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

The WATCHMAKERS



OF SWITZERLAND

**THIS CAMPAIGN WILL MAKE 82,696,593 READER-IMPRESSIONS IN FEBRUARY—IN LIFE, LOOK, SATURDAY EVENING POST, TIME, NEWSWEEK, COUNTRY GENTLEMAN AND FARM JOURNAL.**



**1.** A watch is the gift that truly says—Forever. For a watch is a present with a future—symbol, for you and someone you love, of the wonderful, full time that is ahead, faithfully recording the precious

minutes, hours, days of your lives. Your jeweler has a wide choice of watches to show you, achievements of the skill of free craftsmen—products of America and Switzerland—oldest democracies on two continents.



**2.** There's romance ages old in the watch you buy—the heritage of nearly three centuries of the Swiss watchmaker's art. Swiss craftsmanship has developed lovely new watches for women—with their tiny, but perfect, mechanisms.

## How do you say Forever?



**3.** Ask your jeweler to show you the new self-winding watches and calendar watches, shock-resistant and water-repellent watches, chronographs—and other innovations from Switzerland. He will help you choose the most appropriate type and style.



**4.** The finest watches today are achievements of both America and Switzerland, combining the Swiss art of producing precision movements with the American talent for assembling and designing watch cases. 88% of what Americans spend on watches with Swiss movements stays in the U. S. A.



**5.** How accurate should a watch be? Even the most accurate watch (and leading awards for accuracy are held by a 17-jewel Swiss movement) may vary a few seconds a week. All makes of watches can be serviced economically and promptly, thanks to the efficiency of modern jewelers.

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

The WATCHMAKERS OF SWITZERLAND



... Bulletin from The Watchmakers of Switzerland

# **NEWS!** The New Official Dictionary of Watch Parts is Ready for You!

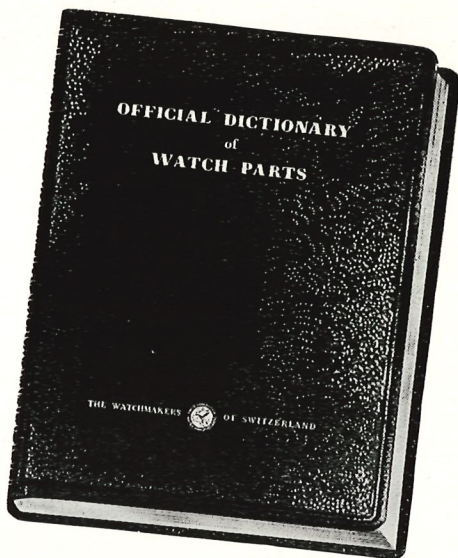
*Prepared by the Watchmakers of Switzerland especially for highly skilled watchmakers and large watch repair departments.*

● 167 pages in length, the Dictionary defines the parts for every type of Swiss movement, even including specialized, out-of-the-ordinary movements. Chronograph, self winding, calendar and alarm watch parts are among the many shown. The dictionary is the most complete and useful reference source of its kind.

● The dictionary shows 600 parts over and above the more frequently used parts which are shown in the dictionary section of The Official Catalogue of Swiss Watch Repair Parts (Part I). Each watch part is illustrated by a photograph—and described in English, Spanish, French, and German. Members of the trade who have seen the dictionary say that no really skilled watchmaker or complete watch repair department should be without it.

● The new Official Dictionary speeds up and simplifies the identification and ordering of parts. It helps you to give complete repair service for any Swiss watch.

**It's a priceless aid to watch repair departments, yet the cost is only \$4.50!  
Order from this magazine today!**



**MAIL COUPON TO  
THIS MAGAZINE**

Gentlemen:

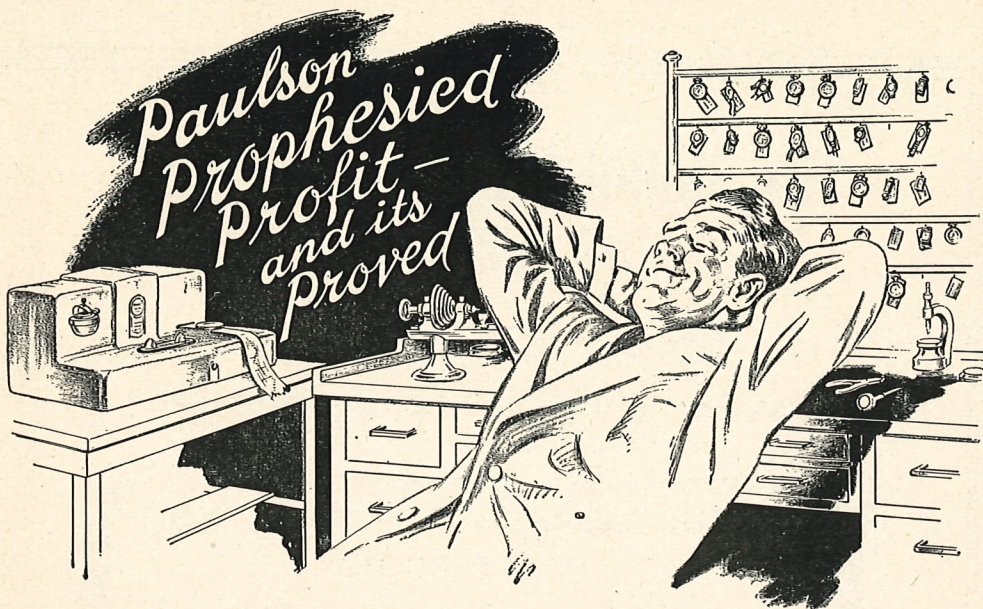
Please send me a copy of the new Official Dictionary of Watch Parts. I enclose  a check,  a money order for \$4.50. (Please do not send cash.)

NAME OF STORE \_\_\_\_\_

ATTENTION OF \_\_\_\_\_

ADDRESS \_\_\_\_\_

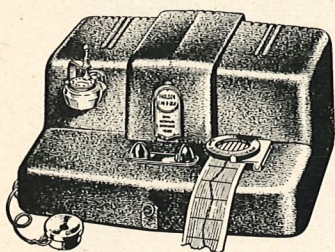
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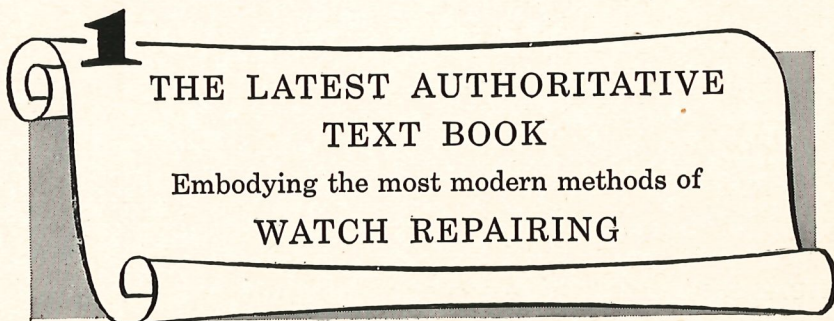
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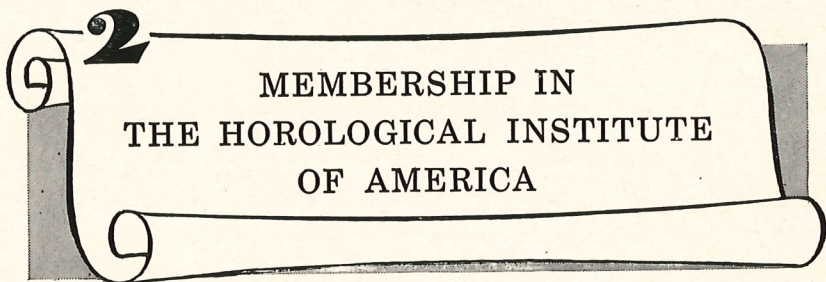
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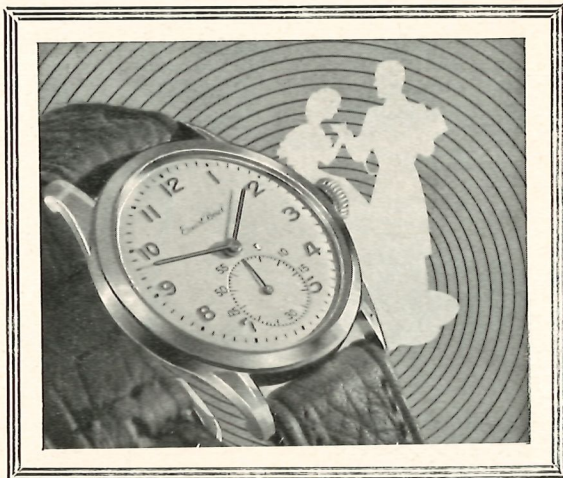
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Illustrated above: 17 Jewel, FF 175 movement in all steel water-resistant case, featuring the new INCASTAR ERNEST BOREL roller stud. To retail for \$49.50 including Federal Tax.

## *Ernest Borel*

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ERNEST BOREL has manufactured consistently fine watches since 1859—watches which are sold in over 90 countries. ALL ERNEST BOREL watches are created to the highest standards. The accuracy of the smallest ERNEST BOREL lady's watch challenges that of its handsome men's wrist chronometers, of which ERNEST BOREL is the world's second largest manufacturer.

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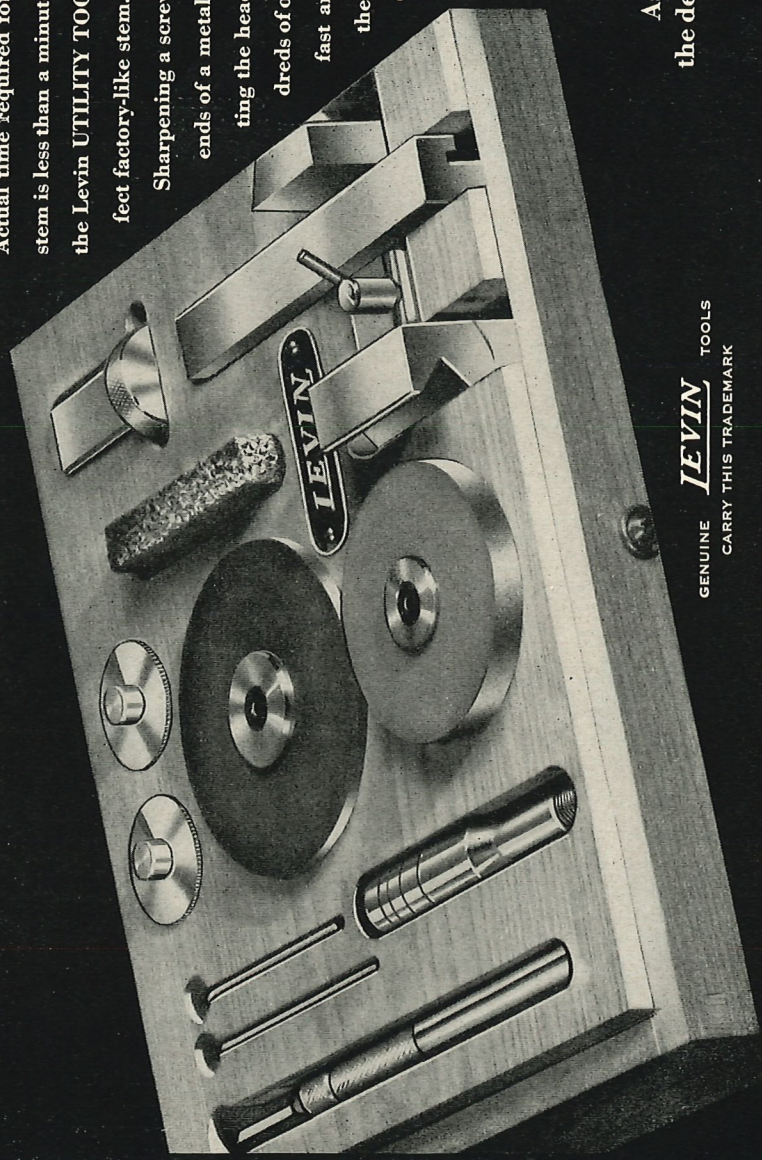
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## At the new Waltham "Series 33" with D. G. Underwood

*Certified Master Watchmaker;  
Member Exec. Board, United Horological Assn. of America;  
Sec.-Treas., North Carolina Watchmakers and Jewelers Assn.*

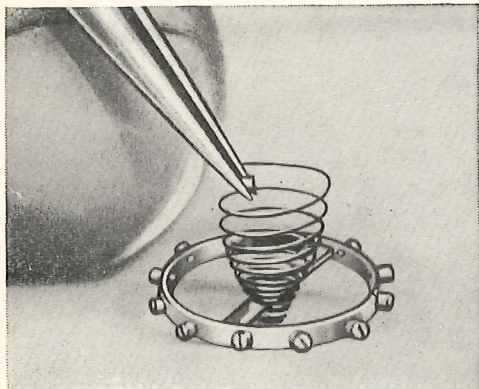
**"Here's another reason why  
the new 'Series 33' is the finest Waltham  
of all time," says Mr. Underwood**

**Mr. D. G. Underwood**, of Winston-Salem, N. C., enjoys a national reputation as a Master Watchmaker and Jeweler. In addition to his outstanding work in the South, Mr. Underwood is active in national horological affairs.

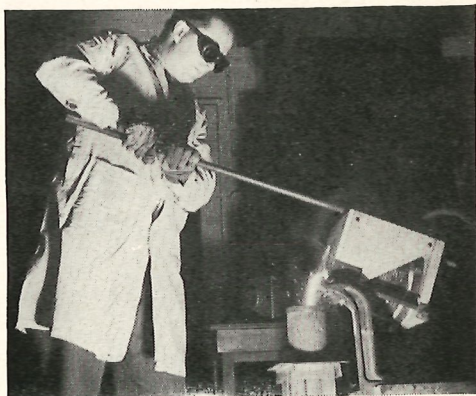
"Of all the parts of a fine watch," says Mr. Underwood, "none is more

important to accuracy and dependability than the hairspring."

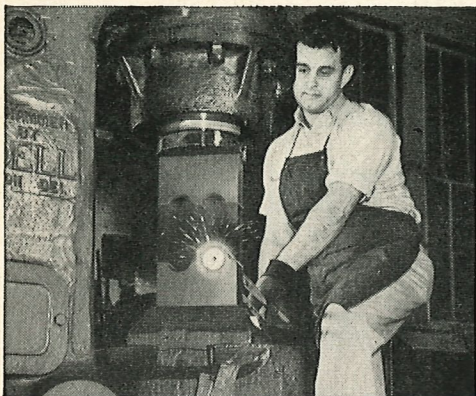
"That is why I think every watchmaker should know the fascinating story behind the hairspring of the new Waltham 'Series 33'. I believe it is one more good reason why the new 'Series 33' is the finest Waltham of all time."



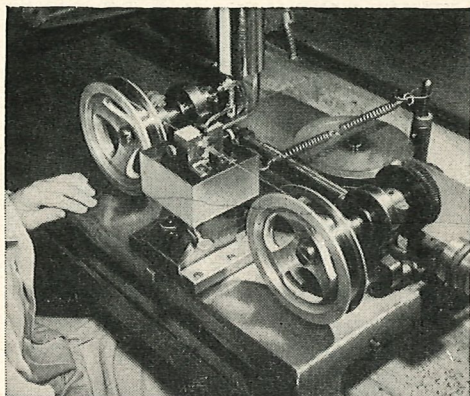
**1.** "Every Waltham hairspring is made of Conel metal, a patented alloy invented and developed by Waltham. Conel is far more accurate than ordinary steel hairsprings because it maintains a nearly constant elasticity regardless of temperature changes."



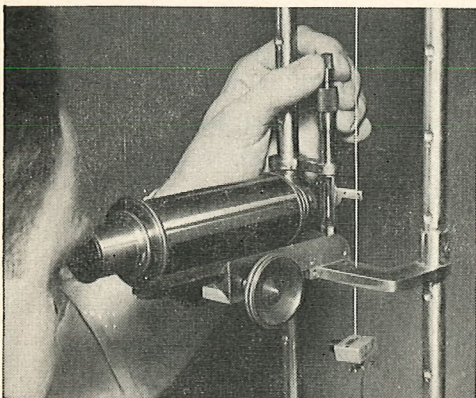
**2.** "Here in the Waltham metallurgy laboratory is a real, authentic steel mill, complete in every detail. In this furnace, the alloy is prepared under strictest controls. Conel metal is as tough as finest-tempered steel, but is rust-resisting, non-magnetic."



3. "After the ingot has been cast, and subjected to a series of X-ray and other tests, it is forged into a bar 16 in. long. From here it goes through a series of swedging machines and dies from which it finally emerges as 1.2 miles of small, round wire."



4. "On these machines, the Conel wire is drawn through a series of 62 diamond dies each one progressively smaller. After passing through the final die, it is a 100-mile-long ribbon, 1/5 the diameter of a hair... and accurate to 20 millionths of an inch."



5. "Back in the laboratory, the finished Conel wire gets final tests for compensation, hardness, tensile strength and elasticity. After the scientists are completely satisfied, the wire is wound into hairsprings and heat-treated by a special Waltham process."



6. "I feel that the development of Conel metal for Waltham hairsprings is a real watchmaking advancement. It not only gives the jeweler a better watch to sell, but also helps his watchmaker render faster and better repair service to the customer."

Helene  
17 Jewels  
\$71.50

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The new Waltham "Series 33" is made exclusively in America by American craftsmen, to America's highest precision standards.

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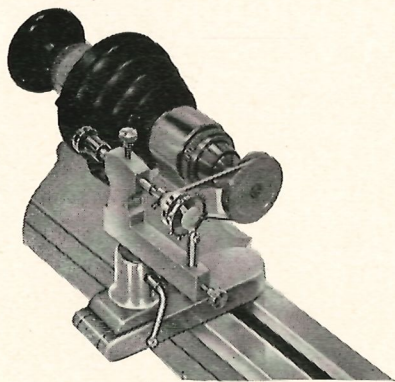
*the magnificent new*

# WALTHAM

*series 33*

Waltham Watch Company, Waltham, Massachusetts

# **SMOOTHER DRIVE . . . MEANS A BETTER JOB**



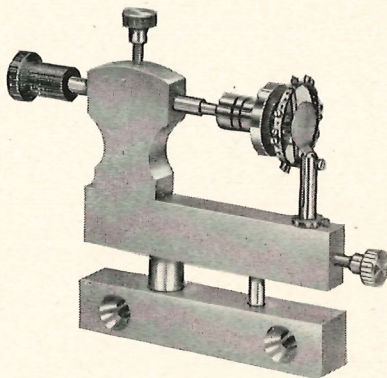
WITH  
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No. 39669 \$13.50

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Lathe or Size of Opening in  
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# THE H. I. A.

DEDICATED TO THE PROGRESS  
AND DEVELOPMENT OF  
HOROLOGY IN AMERICA



# JOURNAL

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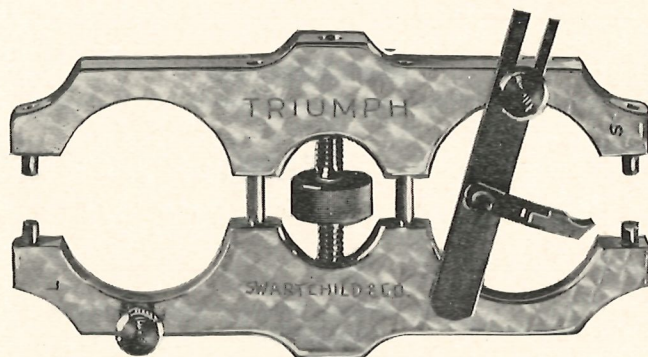
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The subscription of the H. I. A. Journal, single copy, is 25 cents. It is mailed free to members of the Horological Institute of America. The subscription price to individual members of State Horological Associations and/or Guilds (Certification of membership MUST be made by Secretary), is \$2.00 per year, which includes Institute membership. The subscription price to all others is \$3.00 per year. Checks are to be made payable to: "The Horological Institute of America, Inc.," and should be mailed to: "RALPH E. GOULD, Secretary, Washington, D. C., care of National Bureau of Standards.

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\*Denoting the large size.  
\*\*Indicating the small size.

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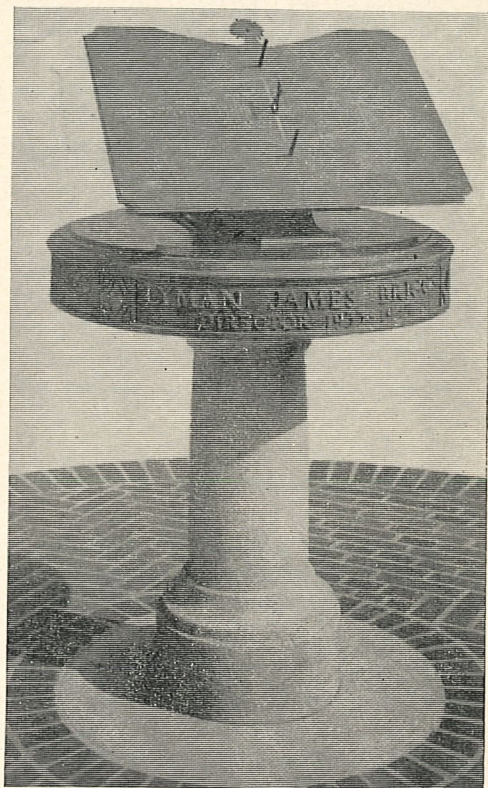
# National Bureau of Standards Commemorative Sundial Erected August, 1948

When Dr. Lyman James Briggs retired in 1945, after having served as Director of the National Bureau of Standards since 1933, a desire to mark the occasion arose in the hearts and minds of his colleagues, whose love and esteem he had so completely won.

We immediately discussed the matter with Dr. Briggs, who expressed the request that no ceremony of any kind be held in connection with his retirement. We learned, however, that Dr. Briggs had for some time cherished the idea that sundial be erected on the grounds of the Bureau as a memorial to its first two Directors, Dr. Samuel Wesley Stratton and Dr. George Kimball Burgess. This gave us the needed clue, and we decided to erect a sundial in honor of Dr. Briggs on the terrace east of the Chemistry building. Furthermore, this sundial would commemorate the services to the National Bureau of Standards of its first three Directors—Doctors Stratton, Burgess and Briggs.

Plans were developed to obtain a sundial of unusual design and as of high a degree of accuracy as could be obtained without the use of adjustments. An authority on sundials was engaged to design and supervise the construction. After numerous delays, due to postwar conditions, the sundial was set in place on August 13, 1948.

The sundial is very favorably located on the main road into the Bureau grounds. Each day it reminds those who had the pleasure of working with Dr. Briggs of his exemplary character and of the high esteem in which he is held. In addition, it will perpetuate the remembrance of the contributions that our first three Directors made toward bringing the National Bureau of Standards into world fame. A detailed description, by the designer, of the com-



Commemorative Sun Dial on the National Bureau of Standards Grounds, Washington, D. C.

memorative sundial and of its use is given on the following pages.

LYMAN JAMES BRIGGS  
*Director June 13, 1933 to  
November 5, 1945*

SAMUEL WESLEY STRATTON  
*Director March 11, 1901 to  
December 31, 1922*

GEORGE KIMBALL BURGESS  
*Director April 23, 1933 to  
July 2, 1932*

**Commemorative Sundial and Its Use**

Our sundial is composed of three principal parts: 1. the base, 2. the dial plate, and 3. the analemma.

### Base

The bronze ring around the pedestal commemorates the Bureau's three former directors. The base plate bears an inscription to Dr. Briggs, as follows: "Erected in 1948 by the members of the staff of the National Bureau of Standards in honor of their third Director, Lyman James Briggs, who retired on November 5, 1945."

### Dial Plate

The hour lines for telling time are inscribed on the dial plate, which reclines from the observer. Three sets of hour lines are used. Each has its own gnomon to cast a shadow, which is used to indicate the time.

The upper and lower gnomons point out Eastern Standard Time every day throughout the year. The middle gnomon resembles an hour glass with a bar across the top; it indicates local apparent time (sun time) throughout the year.

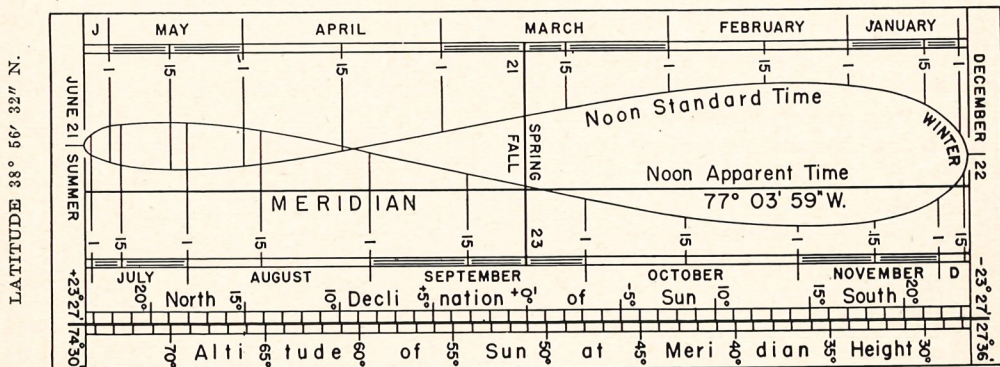
Two sets of hour lines are used to show standard time in order to avoid confusion in reading the time. If the position of the shadow of the upper edge of the pyramidal gnomons is plotted for each hour standard time throughout the year, a series of overlapping figure eights will result; to avoid this overlapping on our dial plate, that portion of the figure eight represent-

ing the period from December 22 to June 21 is separated from that portion representing the period from June 21 to December 22. This produces two sets of deformed hour lines that do not overlap and makes it possible to read standard time directly and easily.

The deformation in the hour lines occurs because a correction has been applied to the hour lines as they appear in the middle or apparent time dial. This correction is the sum of two factors—one variable, the other static.

The first factor is applied to change the local apparent time hours to local mean time hours. This factor is variable and represents the equation of time, which is the difference between mean time and apparent time. It is this application of the equation of time that produces the deformed lines, or figure eights.

The second factor is the difference in longitude, expressed in time, between the sundial's position and the standard time meridian, which in this case is the 75th. This factor is static and remains the same throughout the year; therefore it is applied to adjust the figure eights or deformed lines of local mean time to positions where they become Standard Time hour lines. This adjustment takes place in a lateral direction east or west of their normal position on the dial plate, as the sundial is located east or west of the Standard Time meridian. In this manner the lines are brought into the proper position to indi-



ANALEMMA

cate standard time without the use of tables or mental arithmetic.

### *Analemma*

At the top center of the dial plate there is a sculptured sun, in the center of which there is a very small hole. This hole lies in the plane of the true meridian and is used to allow the rays of the sun to pass through to the arc in back of the dial plate. The spot of light thus formed points out noon Eastern Standard Time and noon local apparent time. On this arc may be seen the full figure eight, or analemma. If this were a local mean time analemma it would cut the meridian line four times and would appear symmetrical with respect to the meridian line.

The correction for longitude difference causes this analemma to be moved bodily to the west or left of the meridian as explained above. The standard time hour lines on the dial plate are just a smaller edition of this full analemma.

Also inscribed on this arc are several facts concerning the position of the sun and calendar references, which are indicated by the spot of light.

### *Use of the Sundial*

An instrument of this kind, which has been constructed carefully, is much more than a time-telling device. It can be used to demonstrate certain well-known and accepted facts about the sun and it can be used to make clear other facts that are not always quite obvious. For example:

1. The irregular apparent motion of the sun can be observed by watching the position of the shadows of the gnomons change from day to day with respect to the hour lines. This irregular apparent motion of the sun is very clearly shown by the analemma.

2. Whether the sun is "slow" or "fast" can be determined easily by comparing the time indicated on the various dials on the dial plate.

3. The difference between apparent and Standard Time can be obtained.

4. When the shadow of the gnomons reaches the central horizontal line on the standard time dials, the sun is on the celestial equator.

5. When the shadows travel along the upper curved lines of the standard time dials, the sun has reached its greatest southern declination and winter begins; likewise when the shadows reach the lower curved lines, the sun has reached its greatest northern declination, and summer begins.

6. The upper and lower horizontal lines at the left and right of each standard time dial indicate the time of sunrise and sunset.

7. The day of the year can be determined when the spot of light is on the analemma.

8. When the spot of light appears on the meridian line, the sun has reached its greatest height above the horizon on that day. The meridian height or altitude of the sun can be obtained in degrees from the right hand column or scale.

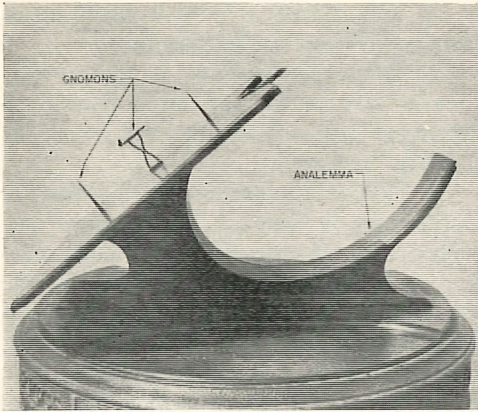
9. When the spot of light is on the meridian line, it signifies that the sun lies in the plane of the true meridian at that moment, and the sun is due south.

10. The sun's declination (number of degrees north or south of the celestial equator) can be obtained from the left column or scale when the spot of light is on the meridian line.

11. The horizontal lines cutting the analemma, in addition to indicating the day of the year, serve to show which side of the analemma should be used for the spot of light to indicate noon Eastern Standard Time.

12. Another purpose of including the analemma is to provide a larger and more accurate hour line by means of which an observer can set his watch correctly at noon.

13. The analemma disproves the usual belief that the sun agrees with the clock four times a year. Note that the analemma



cuts the meridian only twice at Washington. Only when the sundial is on or very close to a standard time meridian will it agree with the clock four times a year. In some localities, Boston for example, the apparent time sundial never agrees with the clock.

#### *General Facts*

The plane of the dial plates lies parallel to the earth's axis; therefore its surface, if extended infinitely, would cut the celestial pole (not the north star).

Because of the position of the dial plate, the sundial is technically referred to as a Polar Sundial.

The bar across the top of the hour glass gnomon points to the celestial pole.

The apparent-time Polar Sundial is one of the easiest and simplest to construct, yet very few have been made.

There are three ways of telling time by the sun—1. by shade, 2. by light, and 3. by a magnetic needle. Our dial makes use of two of these methods—shade and light. The hours on the dial plate are indicated by a shadow, and the time and other data on the analemma are indicated by a spot of light. The combination of light and shade indicators on the same dial is not often seen, but it adds interest to the instrument.

There are three methods of telling time by the sun:

- a. By measuring the hour angle of the sun from the meridian.
- b. By measuring the sun's altitude.
- c. By measuring the sun's azimuth.

Our dial makes use of the most common method—that of measuring the hour angle of the sun, just as does the ordinary garden variety of horizontal sundial with its sloping gnomon.

Sundials can be made to serve a particular place or places, to serve anywhere (universal), or to serve some specific purpose such as a noon mark. Our dial is made for one place—the latitude and longitude of the Bureau's grounds. It cannot be set up in New York, Philadelphia, Chicago, or any other place off its meridian and be made to tell the correct time of the locality. Also, insofar as the analemma is concerned it is made for a specific purpose—to show noon Apparent Time and noon Eastern Standard Time.

The arrangement of words, numerals and other data has been designed to be self-explanatory so that an observer will not require a book of instructions.

#### *Color Scheme*

All incised lines, numerals and figures have been filled with color to make the instrument more interesting and easier to read.

On both the analemma and the dial plate all lines referring to Standard Time have been filled with bright red; all references to apparent time are shown in white; and all references to the calendar are indicated in blue.

Because apparent time is almost always given in the 24-hour system, the apparent time lines on the dial are indicated that way, in Arabic figures; therefore, 3:00 P.M. apparent time is shown as 1500.

Standard Time is the time shown by watches and clocks and their dial faces usually display 12 hours; therefore, the Standard Time hours on our dial are marked in the same system in Roman numerals.

### *Acknowledgments*

We are especially indebted to Mr. R. Newton Mayall, who designed and supervised the construction of our sundial. The Colonial Brass Company fabricated the parts. Mr. Frederick Bagshaw did the en-

graving. The pedestal for the sundial was made by the Earley Studio. The bronze ring around the top of the pedestal was cast in our Bureau foundry.

*National Bureau of Standards  
Welfare Association*

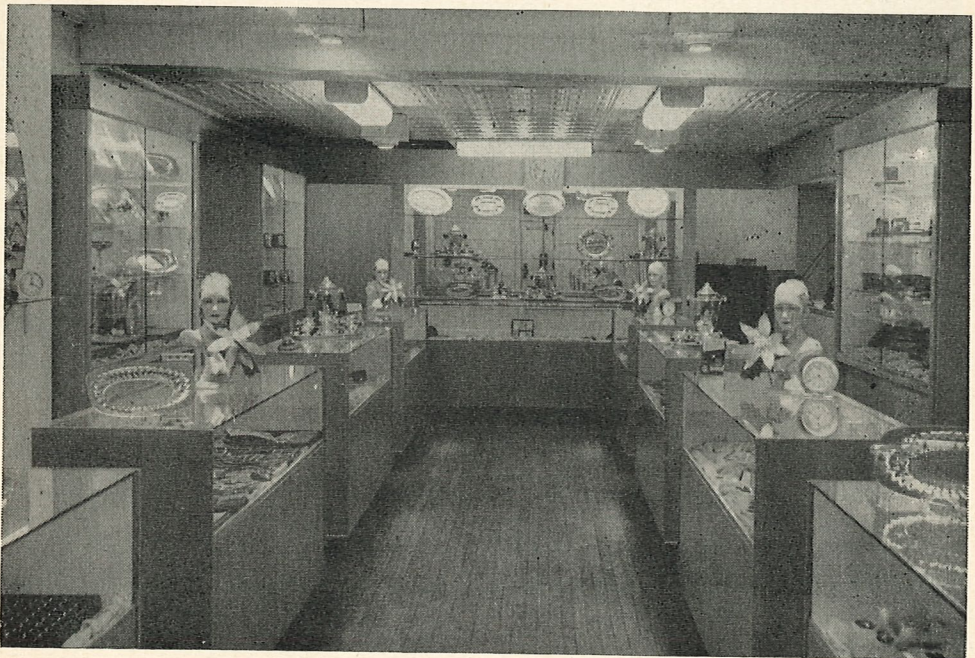
## Educating Your Watch Repair Customers

From a small shop with a single watchmaking bench to a remodeled store with nine floor cases and nine wall cases, all in bleached oak, employing three watchmakers and two apprentices . . . that is the success story of R. F. Bowers, a H. I. A. certified master watchmaker and jeweler of Shippensburg, Pa.

made this growth possible.

It was two years ago that Mr. Bowers and his department manager reorganized the shop so that it now serves at maximum efficiency for both their watch repairing and their jewelry business.

The repair department was originally in the back of the Bowers store, and when



**Retail Jewelry Store of R. F. Bowers, Shippensburg, Pennsylvania.**

Shippensburg is a community of 5,000 persons, yet in 20 years Jeweler Bowers and his watch repair department manager, Mrs. K. H. Grove, have found out that a sound business-like repair policy, coupled with up-to-date store modernization, has

the modernization took place, was moved to the side of the shop where, in Mr. Bowers' own words, "It is as pleasing to the eye as the rest of the store."

The jeweler points out that the repair department modernization can be done

quite inexpensively. He nailed plywood over the front of the work benches and a balance overhead. This, painted in the general color scheme of the entire store, made his repair department both conspicuous and accessible to the customer entering the shop.

On the point of modernization, as it applies to all watch repair departments, the newest development is the introduction of the Official Catalogue of Swiss Watch Repair Parts (Part I) which establishes a single system for ordering repair parts, and

gram of educating the public has played a most important part in the growth of their watch repair business . . . together with a definite increase in their jewelry sales.

There has been a policy in the Bowers store since the modernization that the firm's head believes has been greatly instrumental in creating customer satisfaction. Prior to taking in a watch for repair, the timepiece is examined and an estimate given. If, upon detailed tearing down, when



Watch Repair Department of R. F. Bowers.

Reading Left to Right: Miss Dorothy J. Bowers, Miss Phyllis J. Bowers, Rennes F. Bowers, H. I. A. Certified Master Watchmaker; Mrs. K. H. Grove and Rennes F. Bowers, Jr., H. I. A. Certified Master Watchmaker.

is of tremendous help in ordering an inventory stock.

A rule that Mr. Bowers has put into effect with his personnel has been to keep their benches neat and clean at all times, and to work on one watch at a time.

"Our customers," he states, "have shown a very great desire to watch for a minute while their own watches are being examined, and we let them look—if they want—at their watches through the 'loupe'."

The jewelers and his department manager definitely feel that their consistent pro-

working on the watch a little later, the watchmaker finds the cost to be higher than the original estimate given, he stops his work, boxes the watch, and makes out a report on the corrected cost. The customer then decides what he wants to do when he calls for his timepiece.

A Bowers customer is always told exactly what was wrong with his watch. The repairer notes all defects and repairs made on the attached repair tag, and pastes all replaced old parts to the tag with scotch tape. Correct terminology is made in tell-

ing what was wrong, such as calling a "set" mainspring a "set" mainspring, and not a broken jewel.

It is the store's policy to get a fair charge for everything, and never an undercharge or overcharge.

Mr. Bower's advice for successful repair department business is basic, but most worthwhile. "In general," he states, "do all phases of the watchmaking possible in your own shop 'under the customer's nose' where he can see and where you can educate him on what to expect from his watch. At the same time you can tell him how to care for it.

"This," he concludes, "I have found to be the most inexpensive yet the best, advertising for my shop, especially when coupled with the ultimate in sales builders—offering the highest quality work and the resultant finest possible repair work."

Mr. Bowers is ably assisted in his watch repair department by his oldest son, Rennes F. Bowers, Jr., a World War II veteran, who was assigned to precision instrument and bomb-sight maintenance; his daughter, Phyllis, also an expert watchmaker, who has advanced under the skillful supervision of her father, to the stage of her training where she can do a most satisfactory clock repairing job; and another daughter Dorothy, is now capable of doing an expert job of jewelry repairing, spectacle soldering, bead stringing, etc.

They know the retail jewelry business in all its various phases, buying, selling, displaying, store management, even book-keeping.

Prominently displayed in the watch repair department is this unusual sign: "Work together, play together, succeed together, fight together and fail together."

---

## Put "HOROLOGY" to Work In Your Store

By

A. S. ROWE

Among the many thousand members of the Horological Institute of America, how many use the word "horologist" in their business contacts with the public: How many people outside the Institute know what the word means?

Our guess-timate is: not more than one person in ten, if that.

In the average retail store, instead of connecting the watchmaker at his bench with "horology," he is most often regarded by customers as the "repair man" who works on watches that have stopped running.

This failure to establish the professional horological training of watchmakers among customers is unfair to the traditions of a

craft that goes back for centuries in Switzerland, more recently in the United States, and numbers among its members some of the keenest minds in history. It is unprofitable to disguise the skill of the expert at the bench under the term of "repairer" when he is capable of directing extra traffic into the store through his ability to service watches.

Too little effort has been expended in capitalizing on their increased customer traffic that will respond to the idea of bringing in a watch to be serviced and inspected with regularity.

With the emphasis on repair work, alone, the watchmaker's bench accounted for ap-

proximately \$100,000,000 worth of business in one year. In terms of your own operation, watch and jewelry repairs accounted for about 10 per cent of the average jewelry store's annual volume.

But that's the *average* store. The fact is that whenever a member of the H. I. A. sets out to promote his watchmaking facilities, he is rewarded with a well above average volume from that source alone, and a heavier overall volume from the sale of merchandise to new customers attracted by the repair *services*.

Looking at the case histories of these successful "horological" operations, it becomes apparent that these members put over the idea in their community of servicing a watch *before* it stopped running, and the fact that the technician to whom a watch is entrusted is a professional.

They promoted the watchmaker's bench with the same aggressiveness as their ring or silverware departments. They tried to get away from the limiting word "repairs" and promoted the "horology" department as providing preventive care for watches.

Since practically everyone owns at least one watch, everyone reading the jewelers' ads and promotion pieces is a real prospect.

One store suggests that all watches should be checked after a specified period of time by "An Expert Horologist"—that, in this way, serious damage can be avoided and the life of the movement prolonged.

Once the customer brings in a watch for a check-up, put his name on file. (This is a splendid source of mailing lists—it is much more difficult to secure the name of a customer who merely comes in to "shop" for a ring or silverware.) And after an established period of time has elapsed, send the customer a reminder for further servicing of the watch. The objective is to make him an all-round customer of the store by creating confidence in the services you offer.

Advertising and promotion is not going

to do the entire job. They must be supported by your personal selling of the "horology" plan to overcome the long-established "repair thinking" in the minds of people. You will have to get across the concept that a check-up is going to save the watch-owner money and time in the long run, that your service is definitely for his benefit.

But you won't be alone in your efforts to put this story across. Suppliers and manufacturers of watchmakers' merchandise, tools and materials are ready to help in modernizing the "horological" department, and in recommending control and inventory systems. At least one very large national advertiser, The Watchmakers of Switzerland, has been laying the groundwork for just such a promotion. Each of the advertisements in this campaign—some reach 180,000,000 readers a month—stress the service available from the watchmaker's department.

Significantly, the ads point out that the reader's watch can be "serviced" at the jewelry store. They give specific tips as to how watches can best be cared for, with such admonitions as: "All watches should be wound gently and regularly, and cleaned by your jeweler once a year."

As a further help in this direction, The Watchmakers of Switzerland are sponsoring a special program to help in the service and ordering of parts for Swiss watches. They are still distributing their Official Catalogue to all watch repair outlets which sets up a single, standard system of identifying and ordering parts. This more efficient system can save the watchmaker's time and enables him to give faster and improved service, another way of saying that efficiency can be increased to help you push your volume above the average 10 per cent figure and aim at 30 or more per cent.

Figure it out in dollars, then put "horology"—and what it can mean—to work for you!



# Watchmaker's Dream Comes True



Robert A. Nicholson and his friend, Ernest Millholland.

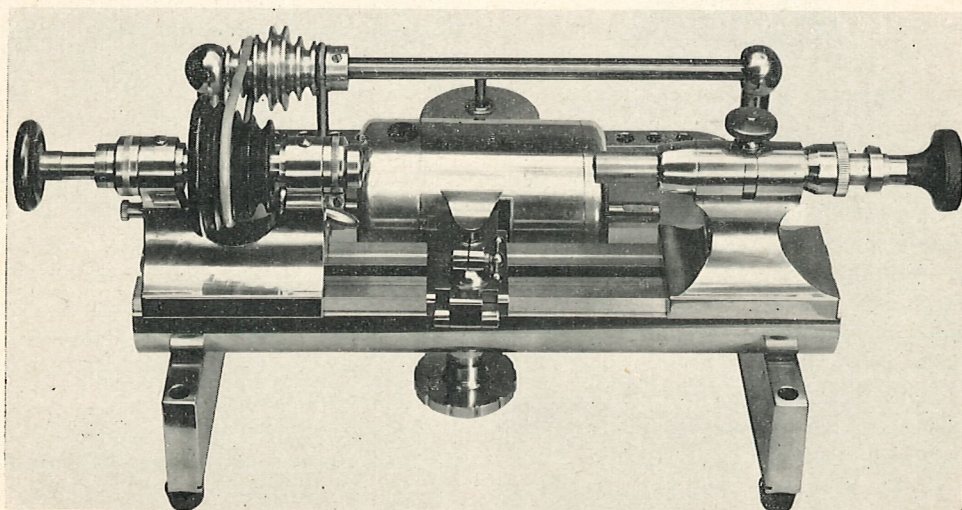
More than a quarter of a century ago Robert A. (Bob) Nicholson, who operates a nation-wide watch repairing service at 415 State Life Building, Indianapolis, Indiana, started planning in his mind the kind of watchmaker's lathe that some day he intended to own. Just the other day Bob Nicholson's dream became a reality, when his lifelong friend Ernest Millholland, president of the Millholland Screw Products Corporation, walked into Nicholson's shop with a sparkling stainless steel

lathe under his arm and said, "Here you are, Bob."

All told, this little lathe required four years to design and build. Two years of this time was taken up by frequent conferences between Nicholson and Millholland in deciding, down to the most minute detail, what special features were to be incorporated in the lathe.

When the time came to start actual work, the Millholland screw products factory was swamped with large orders, and every toolmaker in the shop had work ahead of him for at least a year. In order to avoid disappointing an old friend who had waited so long for his "dream" lathe, Ernest Millholland, president of his company and a master toolmaker in his own right, put on his shop apron and started in to build the lathe with his own hands!

By working evenings, Saturday afternoons and Sundays—whenever one of his busy tool room machines was "open," the president of the company finally completed his friend's lathe in just a few weeks less than two years.



Stainless Steel Watchmakers Lathe, built by Ernest Millholland.

Here are the specifications of Bob Nicholson's lathe:

All metal parts of the lathe exposed to contact with the owner's hands are made of highly polished *stainless steel*, including the bed, head stock, tail stock, T-rest assembly, and universal three-jaw face plate.

The BED is 1.800" diameter by 11" long, over all, with all aligning surfaces precision ground.

The HEAD STOCK is fitted with hardened, ground, and lapped double-taper bearings, front and rear, and is equipped with a draw bar attachment for W-W chucks.

The TAIL STOCK has metric micrometer adjustment and quick-acting spindle clamp, and is also designed to use W-W chucks.

The UNIVERSAL FACE PLATE is made completely of stainless steel.

The lathe is mounted on a U-shaped stainless steel base that is drilled to receive 26 chucks. Two upright stainless steel posts, fitted with high speed ball bearings, support the counter shaft and sliding step pulley that is driven by a 14,500 r.p.m. motor of 1/10 h.p. Twelve spindle speeds, from 2,240 to 14,500 r.p.m. are provided. The motor and starting switch are mounted on the base behind the lathe.

Weight of the lathe is 16 pounds.

Needless to say, Bob Nicholson is delighted with his new lathe, and its builder got more than money for his work—the double-barreled satisfaction of personally turning out a masterpiece of tool craftsmanship while at the same time helping to make a friend's lifelong dream come true.



## NEW YORK HOROS HEAR SPEAKERS

Details of the activities of the Swiss Watch Repair Parts Bureau were reviewed by two interesting speakers at the November meeting of the Horological Society of New York. Speakers were Alvin Levine, editor of "Jewelry," and Ted Joseph, a public relations director.

More than 200 New York members and guests attended the meeting. Andrew Park, president, presided.

In his talk, Mr. Levine reviewed the contest sponsored by the Swiss Watch

Repair Parts Bureau, and announced that Benjamin Mellenhoff, manager of the watch repair department of Tiffany, had won a Bergeon lathe as first prize in the contest. He also announced that Mac Friedman of Longines Wittnauer Watch Company had won second prize, a Zeitz friction jewellery tool; and that Mr. Meltzer of Helros Jewelers, had won third prize, a Zeitz friction tool.

Mr. Joseph, who pinch-hitted for Paul A. Tschudin as a speaker, outlined the purpose and scope of the Swiss Watch Repair Parts Bureau program, and also reviewed the importance of the comprehensive catalogue and dictionary of watch repair parts of the Swiss watchmakers.

A film, "The Watch Mechanism," was also shown at the meeting.

President Park announced the appointment of members of a nominating committee for the January meeting, composed of C. K. Johns, Mr. Mellenhoff, James J.

O'Shaughnessy, Barney Goldstein, Paul Zwillinger and Samuel Greenglass. The annual election will be held at the January meeting of the society.



President Andrew Park (left) is shown introducing the featured speaker, Paul A. Tschudin, (right), director, Swiss Watch Repair Parts Information Bureau, Inc., at the December meeting of the Horological Society of New York. Mr. Tschudin was invited to outline the latest developments and answer questions concerning the application of the new Swiss Watch Repair Program. Mr. Tschudin had just returned from a personal survey of the Canadian horological trade, preparatory to introducing the program in that market early this year.

#### SNAIL—

A snail-like cam used generally for gradually lifting and suddenly discharging a lever, as in the striking mechanism of clocks.

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## Veteran Watchmaker Dies in New York City

Jacques LeRoy of New York City, 76 years old, passed away at his home, 252 East Sixty-first Street, on November 15, having been a member of the Horological Society of New York for over forty years. He was an honorary member of the Horological Institute of America.



Jacques LeRoy

Mr. LeRoy was born in Budapest, Hungary, where he learned the watchmaking trade from his father. After his apprenticeship, he worked several years in Vienna, Switzerland, Germany and Paris. He came to America about fifty years ago.

He was active in trade organizations and was a member of the A. N. R. J. A. for over thirty years. He affiliated with the Horological Society of New York in 1923, and was elected to the advisory council in

1931. He was elected to the executive committee in 1932 and served until 1936. He was named regional vice-president in 1936. He was elected an honorary member in 1939.

Mr. LeRoy served on the examining board of the New York Horological Society for several years, part of which time he served as chairman of the board. He resigned in 1939 on account of ill health.

Mr. LeRoy took an active interest in the Horological Institute of America and its program for better horology.

Mr. LeRoy was a member of Gotham Lodge, 901, F. & A. M. He is survived by the widow, Olga LeRoy, two daughters, Mrs. Hortense Levy and Mrs. Edna Leeds; and three grandchildren.

As a descendant of the famous Hungarian LeRoy family, Mr. LeRoy had a background of horology that made him one of the outstanding craftsmen of America. Members and officers of the New York Society characterize him as "a prince of a man."

## MILTON BURDEN DIES

Milton Burden, 58, of Indianapolis, well-known Hoosier watchmaker, died December 11, at the Methodist Hospital. Death was due to pneumonia, the after effects of a brain operation.

He was born at Golokovka, Russia, in 1891, coming to America in 1913. For a short time he was employed as a watchmaker in New York City. His spirit of adventure and knowledge of opportunities for young, ambitious and competent watchmakers, lured him to the Middle West, where he secured a position as watchmaker with a Mr. Curtis, a well-known watchmaker of Warsaw, Indiana.



Milton Burden

A few years later, Mr. Burden opened his own retail jewelry store and watch repair shop in his adopted city, where he operated until 1933, when he closed out his business and moved to Indianapolis, where he was employed by Charles Mayer and Company and George Kern. Later, he was connected with Dr. Joseph Kernel, a prominent optometrist. However, due to the shortage of watchmakers, after Pearl Harbor, he returned to his watchmaking profession and opened a trade watch repair shop, which he operated until his death.

"Milt" Burden was a watchmaker of unusual ability, an enthusiastic Watchmakers Association of Indiana worker, and was president of the Watchmakers Guild at the time of his death. He was a member of the

Watchmakers Association of Indiana, the Capital City Masonic Lodge, and Methodist Church.

Survivors are his wife, Delores, a son, and two daughters.

## DECEASED

Lorenzo D. Brewster, watchmaker with Kinton's, Inc., 108 West Main Street, Durham, N. C., recently died. He was 61 years old.

★ ★ ★

Victor Bruder, a retired watchmaker at Ft. Wayne, Ind., died at the age of 79. He was the nephew of August Bruder, deceased, well-known Central states retail jeweler.

★ ★ ★

Arthur Kunestler, watchmaker and jeweler, associated with his son, at 689 Main Avenue, Passaic, N. J., died at the age of 82.

★ ★ ★

Albert O. Carlson, 45, watchmaker, W. J. Kapples Co., Pittsburgh, Pa., for the past 17 years, recently died.

★ ★ ★

John Novak, Milwaukee, and Wisconsin's oldest watchmaker, recently died. He claimed to be over 100 years old.

★ ★ ★

Sam B. Lafernery, watchmaker of Monticello, Ark., recently passed away. He was 72 years old.

# Bestfit

means best  
quality in

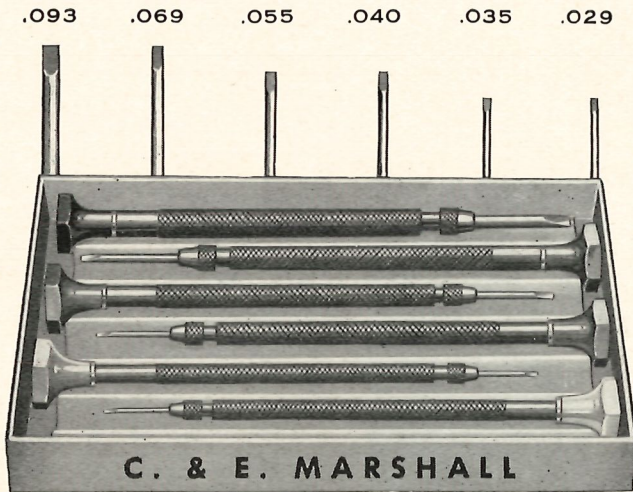
# HANDS



# WATCH-CRAFT

REG. U.S. PATENT OFFICE . No. 348436

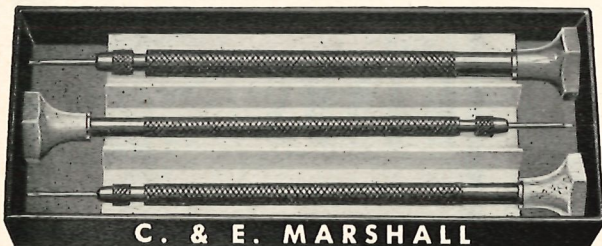
# DOUBLE END



Set of 6 Light Weight Screw Drivers with reversible blades and 3 different diameter sizes in the handles . . . 2 of each size handle. Handles are in proportion to the blades, so you get the right "feel" when you use them. Has sleeve style blade holders. Every part is of high grade steel except plastic tops. Tops are of 6 different colors for quick, easy identification of sizes. WATCH-CRAFT screw drivers are an amazing improvement over the heavier, clumsy types. Comes complete with blade dimensions printed on box. Price is pre-war

. . . quality is WATCH-CRAFT. No. 42183. Set of 3 WATCH-CRAFT Jewel Screw Drivers illustrated below. Has the same quality, design and "feel" as the larger set. Three different colored plastic tops . . . body and reversible blades of high grade steel. Comes complete with blade dimensions printed on the box. Two body sizes with the length and diameter of handles in proportion to the blades for better balance. Both sets DESIGNED . . . MANUFACTURED . . . GUARANTEED BY C. & E. MARSHALL CO.

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SET OF 3  
Different Colored Tops  
No. 42185

\$1.35

# SCREW DRIVERS

F 6

75

SIZE

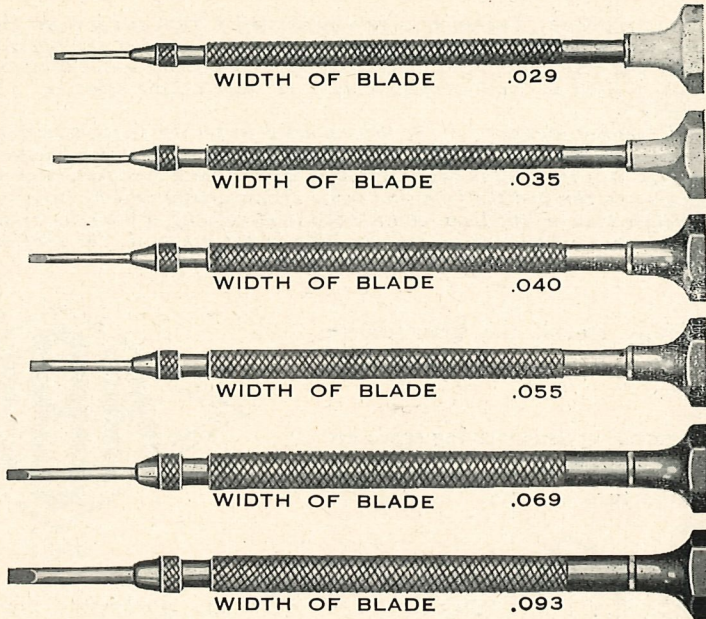
183



colored

tops

blades



**EXTRA BLADES  
FOR BOTH SETS  
OF  
SCREW DRIVERS**

No. 42184

	¼ Doz. or More of a Size	Less than ¼ Doz. of a Size
1 Doz. ....	\$ .90	\$1.20
½ Doz. ....	.55	.75
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(Mostly Small)  
All Sizes.....\$1.00**

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# A Practical Training Program for The Engraver-Beginner

EDITOR'S NOTE: *Engraving is both an art and a craft, and it is not the intention of this added training feature to create artists but to develop and apply the watch-makers and their apprentices' craftsmanship ability along mechanical lines to produce in a more or less mechanical way, a passable artistic effort or "a reasonable facsimile."*

*It does not always hold true that an artist makes the most successful engraver, or is always true that a beautiful hand-writer makes a successful letter engraver. However, it is true that the outstanding engravers are a combination of both.*

*Therefore, this and the following series of instructions will be based on mechanical rather than artistic lines. A little practice each day, a little determination, and in a reasonable length of time you will be in position to do the simpler forms of engraving.*

As previously stated, the space design for engraving governs the style and space of the letters.

The "diamond" style engraving space design, with its variations, is a popular one among manufacturers. (Fig. 1).

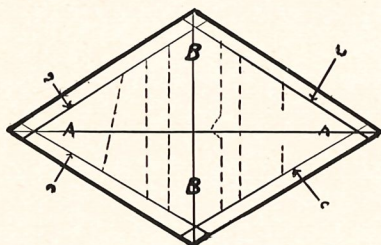


Fig. 1

Block style letters adapt themselves to the "diamond" type engraving space design and will prove popular with a large number of customers. No unusual amount of designing activity or cutting skill is required for this type engraving. This type letter offers a large variety of "finishes"—"wriggle" cut; solid "bright cut"; solid lining graver cut, lining graver "wriggle" cut; or combinations of the above-mentioned cuts. Some customers consider this arrangement of the initials as a "monogram."

## PROCEDURE:

Figure 2 shows the "solid cut" design with the border "C," perpendicular line

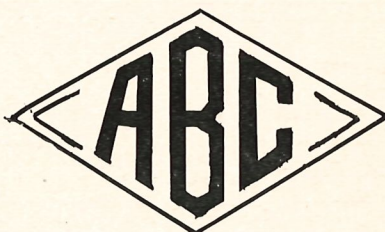


Fig. 2

"B" and horizontal line "A" removed. NOTE: The dart-shaped cuts at the right and left help to convey the design angles.

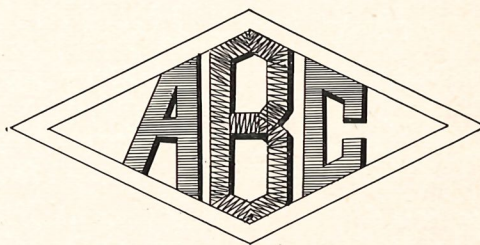


Fig. 3

Figure 3 shows the diamond engraving space design in a horizontal position and with letters finished in different styles.

Figure 4 shows the diamond engraving space in perpendicular position. NOTE: With the diamond engraving space design in this position the formation of the first and last initials sometimes require different forms, i. e., "A."



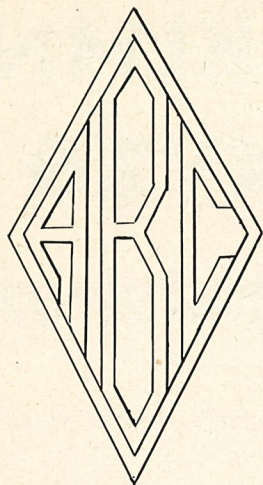


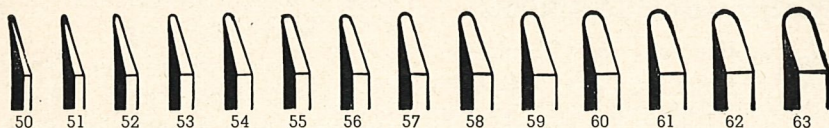
Fig. 4

### PROCEDURE:

- (a) Divide the space equally by a horizontal and perpendicular line (A + B)
- (b) Inside the "frame" draw a light border line (c)
- (c) Design the center initial first. NOTE: The width of the letter is usually one-fourth its height. Exception, the initial I.
- (d) The space between the initials should be approximately the width of the body lines. (See Fig. 2)



Fig. 5



Round Face

Fig. 6

The round-face comes in various widths; the narrowest being No. 50 and increasing in size to No. 63, as shown in FIG. 6.

A practical assortment of this style graver are numbers 50, 52, 54, 56, 68, 60.

The round-faced gravers are especially adapted for cutting small sized letters on soft metals, usually used in manufacture of loving cups, trophies, etc. Because of the nature of the cut, the highly polished round face of the graver reflects the light to a greater extent than any other style engraving tool.

As is customary with all straight gravers, with exception of lining graver, to "heel-up" or permit "cutting clearance" as shown in Fig. 7.

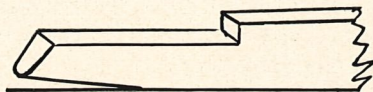


Fig. 7

Care should be exercised in "heeling-up" the round-face graver, to preserve the curved portion of the underneath face, otherwise the "cut" will not be concave.

**ABCDEFGHIJKLMNO  
PQRSTUVWXYZ &**

Fig. 8

**abcdefghijklmn opqrstuvwxyz**

Fig. 9

The round-face graver, while not adaptable for "wriggling," is desirable in making "solid" bright cuts, especially when cutting Gothic letters (Fig. 8-9), and in engraving "seals." (reverse).

It is suggested, when cutting "curves" or round letters, i. e., B, C, D, G, O, P, Q, R, S and U, to cut a light "trough"

outline of the curve with a square graver. This procedure will assure a better control of the graver and a more symmetrical letter. When a wide, round-faced graver is used, it may be necessary to recut several times in order to obtain the full width of the graver cutting face.

### **CHICAGO INSTITUTE AWARDS SCHOLARSHIP**

Paul Leeds, director of the Chicago Institute of Watchmaking, has announced that the institute has established a scholarship award for men who served in the Merchant Marine during World War II.

The scholarship will have a value of \$1,150. It will include a \$750 scholarship in the Institute, a full year course in watchmaking, and \$400 worth of shop equipment, including bench and jeweler's lathe.

A job upon graduation is assured, Mr. Leeds announced. The award for the scholarship is to be given on the basis of war record and applicants' desire to enter the watchmaking field.

All veterans who saw service in the Merchants Marine will be eligible for the scholarship, Mr. Leeds said.

Merchant Marine veterans are not eligible for education under the G. I. "bill of rights," Mr. Leeds pointed out, as are those veterans of the army, navy or other military branches, and therefore the Chi-

cago Institute of Watchmaking has decided to set up the scholarship for veterans of the Merchant Marine.

Mr. Leeds was chief of Veterans Administration Rehabilitation Information in Chicago before founding the Institute.

Applications should be sent to the Chicago Institute of Watchmaking, Merchant Marine Scholarship, 7 South Pulaski Road, Chicago, Ill., Mr. Leeds announced.

In discussing the work of the Institute, Mr. Leeds said that many outstanding speakers in the field of horology have cooperated to bring important talks to the students. On November 18 last, Mr. Becker of Becker Heckman Co. of Chicago, discussed case repair of watches. John S. Shell, director of research and development of Thomas J. Dee & Company of Chicago, talked on "Heat Treatment of Gold Alloys."

The Institute will continue to bring other speakers before the class to discuss practical problems of watchmaking, Mr. Leeds said.

# "The Half-Century Club"



Marcus Furstenberg

A native of Kolmar, Sweden, he began his watchmakers apprenticeship in 1896. Three years later he went to Stockholm to complete his apprentice training, as he jokingly said "At 7 krona (\$1.86) a week and a cot in the back room of the store." Being ambitious, and possessing unusual mechanical aptitude, Marcus Furstenberg pro-

gressed rapidly in his chosen profession. His sincere interest in improving the welfare of horologists was recognized; his fellow watchmakers elected him secretary of their local organization.

In November, 1905, Furstenberg had the opportunity to come to America; he accepted a well-paying position with a Mr. McNamara, jeweler, in St. Johns, Newfoundland. After 18 months in St. Johns, he decided to locate in the U. S. and, accompanied by his brother, arrived in Boston April 30, 1907. He immediately secured employment with the Waltham Watch Company.

After six years Furstenberg decided to return to watch repairing and secured a position in February, 1913, with Julius C. Walk & Son, Indianapolis. He was fond of the "Hoosier capital" and in August, 1920, opened his own repair shop, which he now operates.

Mr. Furstenberg was active in organizing the Watchmakers Association of Indiana, Inc.; he was elected the first president, and worked for the passage of the Indiana Watchmakers Law. His interest in the advancement of his chosen profession has never waned and he still continues to assist the younger watchmakers to improve their skill and ability.

## **Richmond (Ind.) Watchmaker Appointed to State Board**

Addison Harris, a well-known Richmond watchmaker, has been appointed by Governor Ralph F. Gates to fill the unexpired term of Frank A. Kroetz, Valparaiso, who died recently.

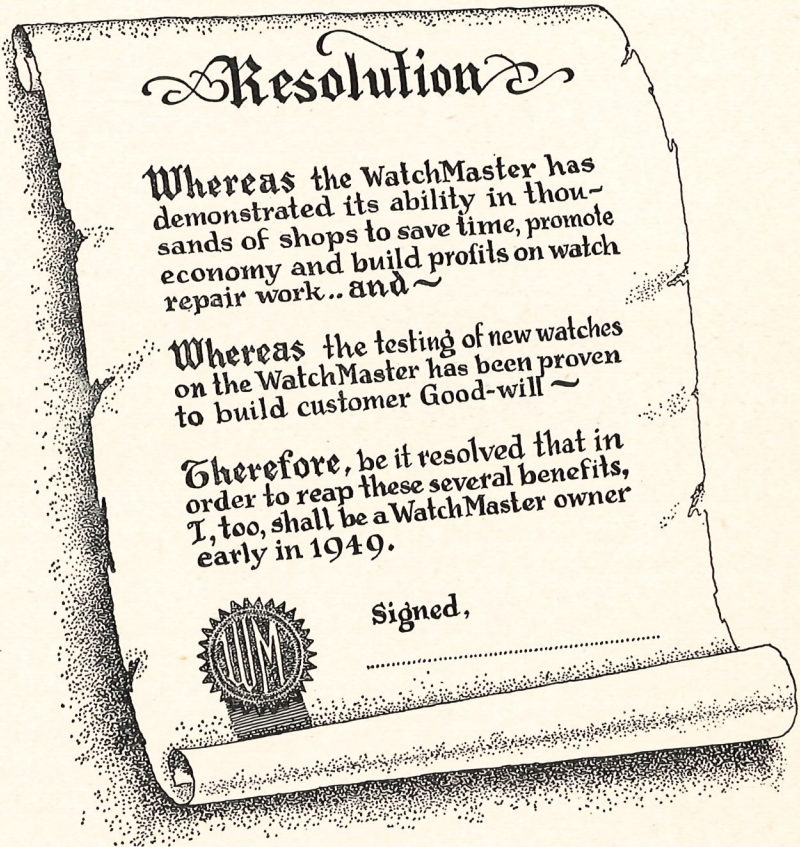
Mr. Harris is well qualified to serve on the Indiana State Board of Examiners in Watch Repairing, being an exceptionally skilled watchmaker himself, and having served in an executive capacity in Precision Instrument Division, at Wright Field,

Dayton, Ohio, for a number of years.

Mr. Harris has been an active member of the Watchmakers Association of Indiana, and former treasurer of that organization. He was active in securing the passage of the Indiana Watchmakers Licensing law in 1939.

The present members of the State Board of Watchmakers Examiners are: President, A. S. Rowe, Indianapolis; vice-president, Raymond B. Medloch, Clinton; J. L. Hunnicut, Rockville; August Krohn, Evansville, and Mr. Harris.

# Make a profit-building Resolution for 1949



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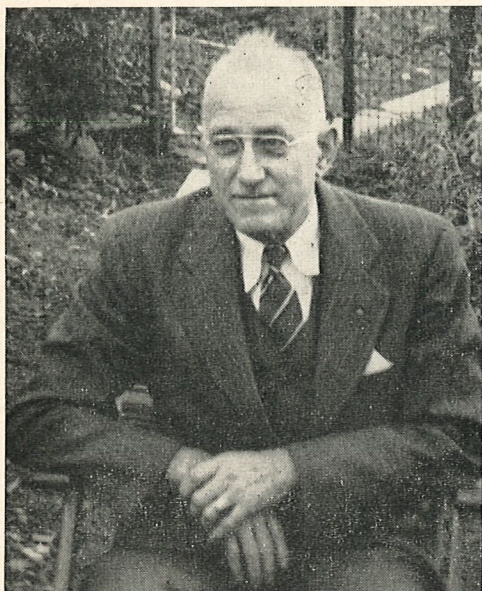
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## NEW JERSEY HOROS ELECT OFFICERS

New officers of the Watchmakers Association of New Jersey are: L. H. Hayenga, president; Thomas Buckner, vice-president; Paul S. Stanoch, secretary, and Robert Halpern, treasurer. They were elected at the November 21 session of the ninth annual convention of the association held in the Olympic Banquet Hall in Irvington, N. J.



L. H. Hayenga, Pres.

Other offices filled are: Emil Haller, trustee; Andrew Stroehlien, Charles J. Miller, Peter Ben and Eugene Jung, directors.

Henry B. Fried of Brooklyn, N. Y., was the principal speaker at the convention. He spoke on "Hairspring Vibrating."

Howard Beehler, dean of the Bulova School of Watchmaking, presided over the election session.

The annual dinner comprised a turkey course, plus "all the trimmings."

Winners of the attendance prizes were Alvin Wilfert, David Rothstein, Benjamin Mellenhoff, Ruth Rothstein, Paul Stanoch, Vincent Deren, Harry Rothstein, Helen Franzephan, Josephine Warakimski, Charles Ross and A. T. Manning.

Dancing followed the dinner, with music provided by "The Doodlers."

During the afternoon business session, reports of officers were given.

## Washington, D. C., Horos Held December Meeting

The Watchmakers' Guild of Greater Washington held its December monthly meeting in the Natural History Building on the night of Dec. 8 at 8 p.m. The principal speakers were J. L. Shearon of Washington, D. C., and Mr. Bettul, also of Washington, D. C.

In his talk, Mr. Shearon discussed the feasibility of a watchmakers' licensing law in the District of Columbia, and he told of the effects of such laws in other states in improving ethical standards, as well as protecting the general public from untrained watchmakers.

Mr. Bettul demonstrated a new balance repairing tool and explained its effectiveness in efficient watch repairing work.

Members of the guild also enjoyed a showing of "A Day in Switzerland," the official film of the Watchmakers of Switzerland, which depicted the work of the Swiss watchmakers and the skill with which they produce watches and watch repair parts.

Members of the guild enjoyed an evening of fellowship and education.

# 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.*

Dear "Professor":

For driving my lathe, I have been using a Dumore motor with a foot pedal control for speed. Motor is belted direct to lathe, and has been satisfactory. Lately I had a job on turning a large diameter piece held in bezel chuck and cannot get enough power out of the motor to take a fairly deep cut on the work. Is there any way to do this without installing a heavier motor? I like this motor so well for all watch work that I don't like to make a change, but would like to be able to do larger work when it does turn up.

Answer:

It is of course unavoidable with a rheostat speed-control that the desirable increase of power with a reduction of speed cannot be obtained. The thing you can do is to install a countershaft between

the motor and the lathe; belting from the small pulley of the motor to a larger pulley on the countershaft will increase power at the latter; and a further increase may be secured by belting from another small pulley on the countershaft to a larger one on the lathe spindle. The usual form of pulleys on both lathes and countershafts, with a variety of diameters of belt grooves, can be used to afford a selection of both speeds and powers for the lathe.

"THE PROFESSOR."

Dear "Professor":

In corresponding about a change of jobs, the party writes me that they expect a watchmaker to turn out ten watches a day. I am accustomed to doing about half that number. What do you think of this question?

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Temporarily, applicants are on waiting list, until "Jam" lessens, which we hope will be soon.

Answer:

The question of what it is fair to expect of a watch maker in output of work is not one that can be answered in a few words. There are too many ifs and buts about it. In different shops there is a great variety in the average kind or grade of watches to handle. One shop may have a large proportion of very high-grade watches, including complicated watches, to do. Another may have middle-grade watches predominating; still another may have rather cheap watches. Another type job has many railroad watches to handle. One employer may have a policy of requiring excellent work done; another of stressing quantity rather than quality. In our opinion this being a poor sort of job for a good workman to have. Some employers use good salesmanship on repair work and get good prices for it; others have a low price policy. All of these things have a bearing on the number of watches a workman should be expected to turn out. In general, we are inclined to favor the idea of rating one's ability in dollars, rather than in the number of watches done per day. This usually can be more fairly related to the amount of wages to be paid. Perhaps the best advice we could give is to inquire about some of the other points suggested above, instead of judging or being judged on the basis of how many watches are to be a day's work; or at least take these other factors into account along with the matter of the number of watches per day.

"THE PROFESSOR."

Dear "Professor":

A customer put me on the spot with a puzzle I could not answer; so I am coming to my old stand-by for help. He had a foreign-made watch and asked me to set it. I couldn't see on it any setting lever, and pulling the stem had no effect. Then he set it and gave me the laugh. I didn't see how he did it; he was too quick about it, or did something I could not see. Can you inform me?

Answer:

The watch your customer had was probably an old Jurgensen time piece. Some of these watches have an ingenious device for setting which is operated by turning the bow of the case down either forward or backward, which shifts the setting mechanism through a collar inside the pendant. Turning the bow up again shifts the mechanism into winding position. The owner no doubt worked the bow cleverly enough so that you did not notice what he did. It is safe to assume that he has had his little joke on many other watchmakers besides yourself!

"THE PROFESSOR."

Dear "Professor":

I have seen several fine old watches of European make with gold enameled cases and small diamonds set around the bezels (open-face cases). These stones appear to be set in some white metal that has become dull looking; so it cannot be platinum; and it does not show the black tarnish that would be on old silver. Can you tell me what metal this might be?

Answer:

Your description of the appearance of the metal in which the stones are set indicates that it is pure block tin. This metal was frequently used in the finest watch cases of the kind and period you refer to because platinum had not come into use for jewelry as early as then; and silver was not as suitable because of its tendency to blacken.

"THE PROFESSOR."

Dear "Professor":

When I find the tops of cap jewel set-given a perfect polish like when they are new?

Answer:

The most convenient thing to use for this kind of polishing is the uncut side of a burnishing file. Make sure that the file surface is clean; twist a piece of watch

paper over the tip of your index finger, and with this rub the jewel setting on the file—that is, of course, over the smooth side of the file—until the surface of the setting top is polished fully. If one has a great deal of this flat polishing to do on gold or brass, it may pay to have a flat jasper-stone lap for the work; these can be bought of watchmakers' supply dealers anywhere.

“THE PROFESSOR.”

QUESTION: I have been given a ship's chronometer to clean. Is such a job about the same as cleaning a fine clock or watch? Is there anything special or different that I should do about it?

ANSWER: There is one precaution very important to observe and many a fine chronometer has been damaged through not observing it. That is, to let down all the power before unfastening the balance cock. If this is not done, the detent that provides locking of escape wheel is apt to be thrown out of position, and then the escape wheel will run rapidly, its teeth colliding with the locking jewel which ruins all the teeth and usually does further damage, too. Outside of this precaution, there is nothing that a really skilled watchmaker need hesitate about in undertaking to clean a chronometer.

QUESTION: How can I remove a finger-mark or greasy spot on plate of watch after it is cleaned without smearing the clean part of plate?

ANSWER: Dip the end of a clean chamois buff (chamois or buckskin *not* charged with rouge) in benzene; absorb surplus benzene on clean rag or paper; rub the grease spot or fingermark quickly with the buff, avoiding touching any other part of the plate.

QUESTION: What is the length of one ligne of Swiss watch diameter measurement in millimeters?

ANSWER: One ligne is equal to 2.256 millimeters.

QUESTION: I have some metal work to do that calls for soldering finished parts that would be spoiled by even a moderate heat. Is there some solder that melts with very little heat? I do not want to use any of the so-called cold solder which is nothing but a cement colored with aluminum powder.

ANSWER: You can do your work with bismuth solder, which is a real metal solder, but which melts at much lower temperature than is required for ordinary soft solder.

QUESTION: I would like to know the trick of using a mouth blowpipe to give a steady blast of flame without stopping it to take another breath. I see it done by a man in the shop where I run errands, but he laughs at me when I ask him to show me.

ANSWER: The continuous blast from a blowpipe is made by allowing the cheeks to fill with air from the lungs, then use air from the pressure of the cheeks to keep the blast going during the time when you must be taking a fresh breath through the nostrils. A little practice will enable you thus to use alternate pressures from cheeks and chest, resulting in an uninterrupted blast through your blowpipe.

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## Gemological Institute Gives Demonstration



Ward H. Cook of Los Angeles, member of the Gemological Institute of America, recently gave a three day series of lectures on gems and stone settings (Oct. 25-27) at the Chicago Institute of Watchmaking, 7 South Pulaski Road, Chicago.

Shown in the picture with Ward who is exhibiting some of the slides and stones used in his lectures are: (left to right), Harold Herron, assistant director of the Chicago Institute of Watchmaking, Mrs. Frederick Toenniges, St. Charles, Ill.; Peter Burgio of the Oakleaves Jewelers, Oak Park, Ill.; Mrs. Martha O'Brien of the Town Jewelers, Chicago; Guy DeFalco of the DeFalco Jewelers, Chicago; Ward H. Cook of Los Angeles, and W. C. Johnson of Chicago.

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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 timekeeping condition.*

## "SETTING UP" THE ESCAPEMENT

By

FRANCIS R. BENTLEY

What is meant by "draw" in the lever escapement; what is meant by "run"; and what is the difference between the two? This question is one that may look very simple to the experienced workman, yet it expresses what is often a puzzling problem to the beginner, and to others to whom escapement work is always more or less of a mystery.

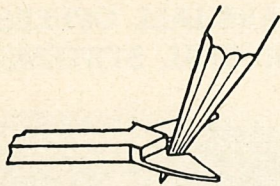
We shall try to answer it, therefore, in such a way as to clear up the matter for any who may be in doubt. We shall begin by defining "run," or "slide" as it is sometimes termed.

Now we know that every moving part in a watch must have a certain amount of freedom. Each pivot must have sufficient side-shake not only to prevent the possibility of its binding in its hole, but also to provide space for the necessary oil supply. End-shake is equally necessary. Each tooth of each wheel must also have a certain amount of freedom in the spaces of the pinion with which it gears, and the wheel itself must have safe clearance—clearance that allows for the presence of a reasonable amount of grit and dirt—between itself and the watch plate.

### *"Run" Insures Freedom for Escaping*

It is for similar reasons—to ensure per-

fect freedom, and also allow for inaccuracies of construction and for dirt — that "drop" and "run" are necessary when we come to the escapement. But what do we mean by "run"? For the purpose of examination, take a 16 or other large movement in which the escapement actions are easily seen, remove the balance, then with a sharpened pegwood placed lightly in the slot of the fork, as shown in Fig. 1, lead the fork gently from side to side and notice carefully all that takes place. At the instant that a tooth of the escape wheel leaves the lifting plane of one pallet another tooth falls upon the locking face of the pallet opposite; but you will notice that the fork at this time has not yet reached the banking pin—a little space still separates them. Release the fork, however, and owing to the action of the wheel tooth upon the pallet it will immediately continue its motion until checked by the banking pin. It is this short supplementary motion of fork and pallets after the drop has taken place that is termed the "run" or "slide." Its sole purpose is to allow safe clearance for the wheel teeth, and beyond this necessary freedom for escaping the bankings should always be set just as close together as possible. Remember this the next time you are tempted to "open up the banks" . . . think again—and don't.



*LEAD the Fork gently with a pegwood.*

FIGURE 1

It is because "draw" is so closely allied to "run" that the young workman finds it hard to distinguish between them. Resuming our test of the actions, however, let us move the fork gently away from the bank, leading and controlling it as before by the pegwood placed in the slot. Do not allow the tooth of the escape wheel that is at rest upon the pallet to become unlocked, but just before it reaches that point—before it passes on to the lifting plane—release the fork. It should return at once to its former position against the bank. Repeat this test two or three times, but instead of releasing the fork altogether carefully feel with how much force the fork tends to return. This is excellent practice, and the workman who intelligently tests every watch he handles in this way will soon learn to judge the amount of draw necessary, and will probably prevent a good many troublesome "stoppers." But the questions still remain. Why does the fork tend to return? What is the force that carries it back to the bank? And by what means is that force provided?

The fork tends to return, is carried safely to the banking, and when there, is held in position with a force sufficient to withstand all ordinary jolts and jars to which the watch may be subjected—through the power of "draw."

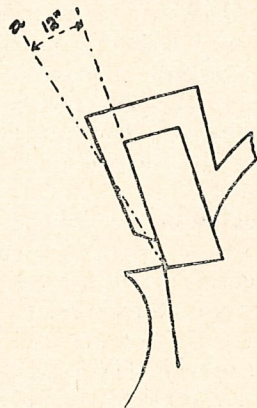
We see, then, that "run" is the space traveled by the fork from drop to bank, and "draw" is the force by virtue of which that little space is covered.

*How Is Necessary Draw Obtained?*

But we must go one step further still to trace the source of draw. If we look once

more at the escapement in hand and move the fork gently until a tooth escapes we notice that after the drop has occurred, and just as soon as a tooth has come to rest upon the locking face of the pallet, the pallet is drawn through the pressure of the wheel tooth upon it, deeper and deeper into the wheel. Of course, when the fork comes in contact with the bank it can go no further—the draw has done its work. Now the reason why the wheel draws the pallet toward its center instead of repelling it, as in the case when impulse is given, is found in the angle at which the pallet stone is set.

Fig. 2 shows a wheel tooth resting upon the locking face of the entrance pallet. The dotted line A, the continuation of a radial line drawn from the wheel center, passes through the locking corner of the tooth, and therefore forms a right angle with the direction of the force of the wheel. It is obvious that if the face of the pallet was made upon this angle there would be no tendency for the wheel tooth to draw it



*SAFE draw is needed but not too strong.*

FIGURE 2

towards the center of the wheel—the tooth would rest "dead" upon the pallet in exactly the same way as in the Graham dead-beat escapement for clocks. Instead, however, the locking face of the pallet is set at an angle of from 12 to 15 degrees, depending on the size and quality of the movement,

with the result that as soon as the tooth falls upon it, instead of being repelled, it simply runs down hill—and it draws the pallet toward the wheel center and the fork to its banking as it goes.

### New Watch Styles Shown at Geneva Exposition

Easy-to-read watch faces surrounded by rubies and emeralds were judged the most popular styles for the coming year at the world-famous Exposition of Watches and Jewels held recently at the Hotel Metropole in Geneva, Switzerland.

More than 15,000 stylists and visitors from all over the world viewed a \$2,000,000 collection of precious watches, gems and jewelry at the exposition, which each year furnishes the creations of leading Swiss craftsmen.

In the field of ladies jeweled wrist watches, the style-conscious visitors were attracted to the new open-faced movements which have beautifully worked intricate settings of rubies and emeralds surrounding the face. Diamonds and semi-precious stones were used mainly as supplementary decor. The designers' interest in red-gold was still strong, although a revived tendency toward delicately worked yellow-gold bracelets, fillagreed and rosetted in antique manner, was noticeable.

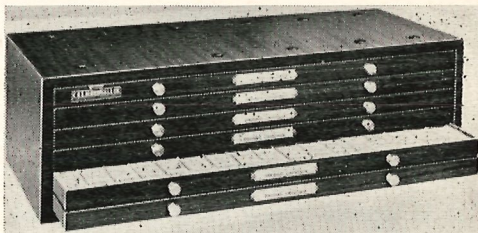
Almost all watches utilizing Geneva craftsmen's ancient art of fine enamel-work found on women's watches in former years, were seen on men's timepieces.

The "serpent" bracelet for women's watches was popular with designers.

Also featured at the exposition were masterpieces of the highest standards of the Swiss watchmakers art.

The most elaborate watch was a pocket model which tells times, days, date and month; a stop-watch mechanism; gives the phases of the moon—to mention only a few of its uses! The thinnest was a man's pocket watch which easily could be slipped between the teeth of a comb. The smallest watch would fit neatly into one end of an elbow macaroni!

### MARSHALL OFFERS CRYSTAL SYSTEMS



The C. & E. Marshall Company has introduced Watch-Craft moulded crystal systems in four different combinations, all in a six-drawer mahogany finish, steel Add-a-Unit cabinet, furnished without extra charge to customers. The complete unit has one each of 408 moulded crystals.

Another smaller unit has one each of 306 moulded crystals, with 102 additional labeled boxes for future expansion. A third unit has 204 moulded crystals with 204 additional labeled boxes. The smallest combination contains 102 crystals with 306 additional labeled boxes.

With each system is furnished a chart showing the types of crystals and the popular watches they will fit. Each crystal is labeled with size and make of watch and is placed in an additional labeled box.

CLOCKWISE: Moving in the same direction as the hands of a clock—from left to right, looking at the top of motion.

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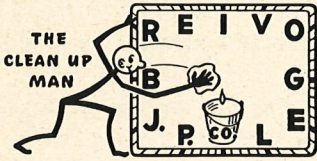


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Dan's been making new dials out of old ones at our place for 30 years or more. We keep him on because he has a habit of making friends—thousands of them—who'd swear on a stack of pocket watches that Dan consistently turns out the finest dial-refinishing 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.

If you're the kind of fellow who insists on fine work and prompt service, drop Dan a line today and receive his price list and free mailing envelopes by return mail.

### P. J. Breivogel Co.

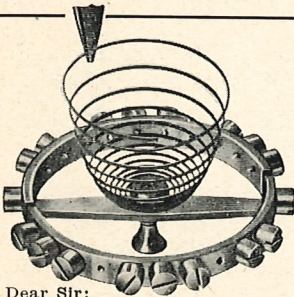
65 Nassau Street, New York 7, N. Y.

## \$7,000 WATCH PARTS THEFT IS SOLVED

Two Indianapolis sewer cleaners recently "unearthed" a "treasure chest," a large trunk, containing \$7,000 worth of watch parts, watch jewels, jewelers tools and watch bands in a sewer outlet at the southwest part of the Hoosier capital.

The "Captain Kidd" loot proved to be the property of H. E. Schmidt, Terre Haute, Ind., jewelry salesman, and had been stolen from his parked car in Indianapolis. The 450-pound trunk had been removed from Mr. Schmidt's car by Lorenzo Pemberton, 21-year-old trucking company employee, who confessed to the police that he had taken the goods and the trunk from the Schmidt automobile and had put them in the sewer outlet after the theft.

Mr. Schmidt is a salesman for the Burton M. Reid & Sons, Inc., a watch material and jewelers supply concern in Springfield, Illinois.



## KNOW YOUR VIBRATOR MAIL DIRECT SAME DAY SERVICE

Flat \$1.75; Brequet \$2.50—Swiss and American

- Fitted to bridge. No levelling necessary.
- Send balance bridge, balance wheel, stud and collet.
- Contract estimates given to watch and clock manufacturers.
- Heavy mailing envelopes and containers sent upon request.
- Jobbers inquiries invited.

### These and many other letters from customers prove our service

Dear Sir:

"Just a few lines to let you know that I appreciated your quick service and expert workmanship of vibrating my hairspring. It was "ON THE NOSE" as they call it, didn't have to touch it at all. I am sure my future work will be handled by you only."—L. Genjian, 1444 Bellaire, Denver, Colo.

Dear Sir:

"I had sent the spring to two other places before you with terrible results. I put it up to you to produce and you did!! I put the spring in the watch—it was perfectly centered and level—my amazement was complete when the Watchmaster showed it in perfect beat and only 15 seconds fast in dial up position—crown down, 30 seconds fast—crown up straight across!! I have already started to spread the good word around."—J. A. Frew, 10228 Park Heights Rd., Cleveland 4, Ohio.

Dear Sir:

"I appreciated the very quick service and the quality of your repairs. The machine says

it's perfect—and in beat!! I'll send all repairs, hereafter, to you."—J. P. Cavanagh, 74 Fairbanks St., Brighton 35, Mass.

Dear Mr. Thomas:

"Recently I have been sending you all of my vibrating jobs, which are not too many. However, I would like to say that your work is super. I have a Watchmaster and the timing is always very close. I'll look forward to your fine service in the future."—R. Paterson, 122 Main St., Danielson, Conn.  
Gentlemen:

"If we weren't already 'sold' on your work we sure would be for the way you handled our last job. One of the boys ruined a collet by trying to open it and we sent the spring on to you in hopes you could put in a new collet, and when it came back marked 'no charge,' that did it. We sure do appreciate your kindness, and whatever we get in will be yours."—Fox's Timing Service, 104 E. Congress Lane, Savannah, Ga.

## HAIRSPRING VIBRATING COMPANY

P. O. Box 330 -:- 406 - 32nd Street.

CHARLES THOMAS

Union City, New Jersey

(Formerly in charge of Hairspring Dept. for Bulova Watch Co.)

## SWISS WATCH PARTS PROGRAM LAUNCHED

Thousands of American watchmakers and jewelers are now using the new program launched by the Swiss Watch Repair Parts Information Bureau, according to an announcement by Paul A. Tschudin, director of the bureau.

Mr. Tschudin pointed out that a total of 30,000 loose-leaf books, dealing with the repair of Swiss movements, will be in the hands of members of the watch repair trade, importers, wholesalers, retailers and horological instructors by the end of December.

Mr. Tschudin said that early in 1949 a program would be carried out to supply Swiss materials in individual packages, but that watchmakers would continue to receive unpackaged materials from their suppliers.

He said that the new program of the Watchmakers of Switzerland was replacing seven individual systems which have been in use and that the bureau headquarters, 730 Fifth Avenue, New York City, had been officially opened and staffed. He said that the new Official Dictionary of Watch Parts was now available to horologists and would fill a definite need.

Mr. Tschudin pointed out that the relationships existing between the retail repairer and his regular supplier would not be changed, since the Bureau does not stock or sell parts.

## Swartchild Introduces Jeweled Poising Caliper for \$5.95!

The tool, bearing Swartchild's TRI-UMPH brand name is fully jeweled at both ends and a balance wheel will revolve so freely in the jeweled bearings that it can be used as a poising tool as well as a caliper. One end has smaller holes and the other larger holes so that all sizes of balances, from tiniest wrist sizes to pocket watch can be accommodated. It is beautifully finished and plated, has an accurate index arm and is supplied complete with truing wrench at \$5.95. The tool is illustrated in Swartchild & Co.'s full page advertisement on page 10.

### *Holiday Greetings to Our Friends and Customers*

We Wish You and Yours—  
*A Happy, Healthy and Prosperous 1949.*

Our Greatly Enlarged Facilities  
Assure You *Even More*

PROMPT AND EFFICIENT  
SERVICE IN 1949.

### **Indiana Jewelers Supply Co.**

429-435 State Life Bldg.  
Indianapolis 4, Ind.

### *"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**

690 Chestnut St., Terre Haute, Ind.



## EARLY AMERICAN CLOCKS

By

JESS E. COLEMAN

(EDITOR'S NOTE: Mr. Coleman, 64 Arcade Building, Nashville, Tenn., is a well known authority on early American clocks.)

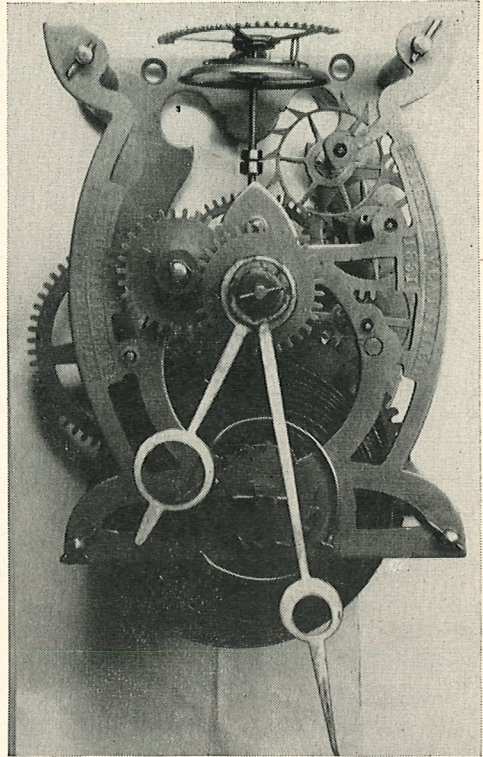
The article, "One of the Early American Clocks," page 15, the April issue, was exceptionally good. This deals with one of those phases of early American clockmaking about which we all know too little.

The cut of the movement in question—page 18, was evidently by the magazine that ran the article. At the time I obtained my patent copy of the "Kirk" patent the drawing portion was out of print. The letters used in the text do not correspond to the lettering on the cut. The only patent granted Kirk, in 1847 was: No. 5045, dated April 3, 1847.

Carl W. Drepperd lists a John Kirk, Bristol, Conn., as working about 1831, but he does not list a "Charles Kirk." This movement so closely resembles the "Litchfield Mnfg. Co.," movements in design as well as having a "frictional" type escapement I'm wondering if there is not some connection. Enclosed: photo of two Litchfield movements. No. 1, I made from the collection of Mr. Edward Ingraham. No. 2 was given to me by Mr. Stallcup. Photo 3 is the label from the Ingraham clock. While the movement is stamped "Litchfield Mfg. Co.," this label says manufactured by Ansonia Clock Company.

Both movements were stamped: "Patent Caveat Filed 1851," which I think means that the inventor has filed some sort of notice that he would file for a patent later. The best information I've been able to obtain from the Patent Office is to the effect that such "caveat" notices of about that period were destroyed, and nothing is available. The "Litchfield" movement is quite similar to the "Kirk," and while it has only "one" escape-wheel, it uses a frictional type escapement, etc.

Just as the cut, page 18 of the April



Early Model, Litchfield Manufacturing Company Clock.

issue brought to my notice this similarity to the "Litchfield" movements, I'm wondering if these photos coupled with it might not bring to some of your readers something that might tend to add to the whole matter. Who was Charles Kirk? Who was the Litchfield Mfg. Co.? Why should their movements appear in Ansonia cases? Were other types of frictional escapements used?

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CENTER OF OSCILLATION: A point on the length of the pendulum, the distance of which from the center of suspension, equals the length of a simple or theoretical pendulum, both beating the same time. The center of the oscillation is always somewhat below the center of gravity of the pendulum.

## AWARD WINNERS ANNOUNCED

The results of the recent Watch Repair Department contest conducted by JEWELRY, the interesting and informative semi-monthly trade publication, has been completed and awards made by a committee composed of Fred Reid, (Burton M. Reid Sons, Springfield, Ill.), president of the Watch Material Distributors Association of America, Inc.; Kenneth Van Cott, Van Cott Jewelers, Binghamton, N. Y.; Sidney Prague, president of Prague-Kurtz Co., watch material and jewelers supplies, Houston, Texas; and Max Strasburg, Strasburg of Hollywood, Los Angeles, California.

So unusual were the technical and practical values of the entries submitted by watchmakers and jewelers from every section of the United States that only after a recheck of the articles, was the committee satisfied to make the final awards. In fact, duplicate grand awards were necessary in the Group C, while triplicate merit awards were made in Groups A, B and C.

The contest was divided into three classifications, and the following prizes were awarded each classification: Grand prize—a fine Eltecna precision Swiss manufactured watchmakers lathe with various attachments; awards of merit, two Seitz friction jewelry tools.

In Group "A," the grand prize was awarded to Benjamin Mellenhoff, member of the Advisory Council of the H.I.A., and manager of Tiffany and Co., New York City, watch and clock department; merit awards, M. Friedman, manager of material department, Longines-Wittnauer Co., (N. Y. C.) and Melvin Posner, jewelry department, manager, Kobacker's, Flint, Mich.

Class "B" Awards—Grand prize, Thelbourne Cooper, manager watch repair department of Eastside Jewelers, Los Angeles, Calif; merit awards, (three-way tie): A. T. Kapelke, Kapelke's of Trini-

dad, Colo.; Chas. A. Martin, manager, watch repair department of Herbert K. Brasfield, jeweler, Tupelo, Miss., and Earl C. Parker, manager, repair department of George F. Kanman, jeweler, Seymour, Indiana.

Class "C"—Grand prize, (tie) Walter Price, Bond Jewelers, Cincinnati, Ohio, and George B. Winton, Winton Jewelers, Newark, N. J. Merit Awards (triple tie): K. W. Fry, Fry's Jewelers, Le Mars, Iowa; Hyman Meltz, Helrose Jewelers, New York City, and David Musik, Washington, D. C.

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## WHAT'S DOING AMONG THE TRADE

Wm. H. P. Ritter, of Orvid, Colo., has recently opened a watch repair shop in that city.

Ray Bloom, Pattonsburg, Mo., has opened a watch repair shop in his home town.

Estel J. Pugh, formerly a watchmaker for Carpenter Jewelry, Moberly, Mo., has purchased the retail jewelry store formerly owned by Anderson Blanton, Paris, Mo.

John L. Hefferon has opened a watch repair shop in Virden, Ill.

Paul E. Schaefer, Virden, Ill., has opened a retail jewelry store and watch repair shop in that city. Mr. Schaefer is an experienced watchmaker, having followed this profession for the past 10 years.

The Julius C. Walk Jewelry Shop, of The William H. Block Company, Indianapolis, was recently robbed of \$6,250 of valuable diamond watches while the store was crowded with holiday shoppers. The thief gained access to the locked showcase containing diamond watches by moving the plate glass top sufficiently to permit his hand to pick up the watches from the tray in which they were displayed. The most valuable watch of the loot contained 52 cut diamonds and was valued at \$2,250.

## HAMILTON EMPLOYEES GET SERVICE AWARDS

Twenty-two veteran Hamilton Company employees, who have completed fifteen years of continuous service during 1948, were presented with gold service award watches by Calvin M. Kendig, company board chairman. The presentation brought the total Hamilton employees, who have received similar watch awards since the inauguration of the plan in 1945 up to 624.

The watches, each appropriately engraved, "To a Craftsman the product of his craft—for long and loyal service," awarded to 16 men and 6 women employees.



Twenty-one of the twenty-two Hamilton employees who earned their 15-year award watches were on hand to receive them from Calvin M. Kendig, Hamilton Board Chairman. Absent from the group was one employee who accepted her award in the hospital after a visit from the stork.

Mr. Kendig, in making the presentations in the company's office building auditorium, congratulated the award recipients for their long and faithful service and thanked them on behalf of the company management.

Lowell F. Halligan, sales and merchandising manager, assisted Mr. Kendig in making the presentations.

Hamilton employees who received 15-year awards are: Christian A. Danielson, finishing; Amos L. Lenhard, dial; Benjamin H. Hackenberger, timing and casing; Mrs. Evelyn Smith, material sales; Florence E. Riale, jewel setting; Elizabeth A. Martin, order; Stanley P. Wiker, inspec-

tion; Carl O. Homsher, machine; Evelyn Schwartz, screw manufacturing; Roland Bowman, train; Maurice C. Shearer, automatic; Richard Shock, machine; John B. Gast, casing; Carl A. Yecker, engineering service; Bruce E. Wolfe, machine; Joseph Centini, equipment and design; Robert Frey, train; Ira C. Mann, production dispatcher; Kathryn C. Young, advertising; John F. Scheffer, escape; J. H. Gegg, production control; Esther Kennett, train department.

15 TOOTH ESCAPE wheel is usually used in watches because of geometrical convenience. 15 divides equally into the 360 degrees of a circle 24 times, or 24 degrees between escape wheel teeth. Allowing the escapement is so designed that the lever embraces three (3) teeth or  $2\frac{1}{2}$  spaces of wheel.  $24^\circ \times 2 = 48^\circ + 5\frac{1}{2}^\circ$  width of tooth and  $5^\circ$ , width of pallet stone (equidistant's escapement) stone =  $508\frac{1}{2}^\circ$ . This allows  $1\frac{1}{2}^\circ$  space for "drop" ( $60^\circ$ ).

16 and 14 tooth escape wheels have been used, however, pallets embracing more than three (3) teeth (16) are heavier and of course increases the unlocking "resistance." Pallets embracing less than three (3) teeth have a poor "lifting" action due to necessary "side shake" in the pallet arbor holes.

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BEST QUALITY  
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**CROWNS**

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IN SEALED ENVELOPES  
FOR YOUR PROTECTION

1/2 DOZEN # \_\_\_\_\_

REFILLS FOR

Genuine  
"THE BESTFIT"

**CROWN**

Assortment # \_\_\_\_\_

**ASK  
YOUR  
JOBBER**

# THE INCASTAR WATCH

For years horological circles have been astir with the innovations of certain watchmakers who, in an attempt to improve the adjustment of their watches, have turned to new ideas, inventions and methods. These changes have aroused a considerable amount of controversy. They also stress the fact that the modern watch manufacturer is making a constant effort toward improving the quality and adjustment of wrist watches. In this respect, Ernest Borel & Co., of Neuchatel, Switzerland, who have been engaged in the manufacture of fine watches for almost a century, have played a leading role by putting to test many of these changes designed to improve the functioning of the modern watch.

In the past few years, some watches have appeared without index-regulators. Some of these have been definitely lacking in a means for easy and quick checking of the daily rate. Others have been fitted with a special balance wheel including movable, bendable masses, permitting corrections in the periods of oscillation of the balance. The leading horologists in Switzerland and France have closely studied these new devices and on several occasions have published reports obtained with such regulatorless watches. In addition, thousands of Rating Certificates granted for these movements by the Swiss Official Authorities entrusted with the control of watches, attest to the unquestionable advantages realized through eliminating the regulator pins which cause an everlasting source of trouble and unsteadiness in the running of wrist watches.

However, the above solution of the problem is not complete because in most instances this type of device impedes an easy adjustment of the daily rate. We cannot ask the watch repair man or even the skilled watchmaker, to make a thorough check of the adjustment, along with milling the balance-screws or adding washers, just for an alteration in the daily rate. Displacing the

movable masses or projections around the balance-rim also means a rather delicate and complicated operation by watchmakers who have had no experience with the new system. Therefore, despite the immediate advantages that manufacturers might find in the absence of regulator pins, it has been thought advisable to take into account the opinion of watch retailers who, fearing difficulties later on, were not enthused and did not push the sale of watches devoid of regulators.

As Mr. L. Defossez, former Principal of the Horological School at Le Locle, explained in his article, 'The Balance Without Index and Regulating,' "The ideal solution does not consist in eliminating the index-regulator, but lies in any organ securing a tense grip of the hairspring while permitting the squeezing point to be displaced lengthwise. Mr. G. A. Berner, Principal of the Bienne Technical School, is of the same opinion. The aforesaid solution," added Mr. Defossez, "would have the advantage of allowing touching up the adjustment in two different ways: the adjuster would operate on the balance and the repairer on the hairspring."

At last a device as described above exists and after extensive tests has been incorporated into Ernest Borel Watches. It is the INCASTAR, devised by Mr. F. Marti, of La Chaux-de-Fonds, the well known inventor of INCABLOC. This ingenious contrivance, often designated by the term 'Roller Stud,' is indeed, a stud, altering the active length of the hairspring. The end of the terminal curve is squeezed between the two rollers which allow the hairspring blade to slide in either direction. When turning a small adjusting star on the regulator side which is fitted on one of the roller-arbors, the latter may be rotated so as to extend or absorb a portion of the hairspring blade. To secure the beat-point of the balance, the whole device is swung around the endpiece.

Therefore, while retaining the advantages of the index-regulator (instantaneous checking of the daily rate) INCASTAR eliminates defects in isochronism due to distance between the regulator pins. Besides, the risk of hairspring locking is eliminated.

Experience has shown that the Ernest Borel watch fitted with INCASTAR is most easily and quickly adjusted. The running is more accurate, constant, and regular.

Furthermore, to facilitate cleaning, the hairspring may be readily 'unstudded' and refitted. Yet, as all Ernest Borel watches fitted with INCASTAR and also provided with INCABLOC, the repairer who objects to separating the hairspring from the bridge will find it most convenient to clean the upper balance-pivot and jewels by taking the INCABLOC apart.

Jules Borel & Co., of Kansas City, Missouri, have recently been appointed exclusive general agents for Ernest Borel Watches in the United States.



No.



No.



Reproduced above are the three designs which have been approved by the H. I. A. official insignia for "Certified Watchmakers" (formerly "Junior Watchmaker") and "Certified Master Watchmaker" (formerly "Certified Watchmaker") and "Certified School."

The "Certified" Master and "Certified" Watchmakers cuts may be obtained by remitting \$1.50 to Ralph E. Gould, Sec'y, c/o National Bureau of Standards, Washington 25, D. C., giving your certificate number. "Certified School" cut may be obtained by remitting \$1.50 to Secretary Gould.

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**STEMS**

1/4 DOZEN # —  
"THE BESTFIT"  
Genuine  
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## NOTICE

Unset jewels, taps and screws for Jewelling Plate used in H.I.A. CERTIFIED MASTER WATCHMAKER examination can be obtained by remitting \$2.00 to Ralph E. Gould, Sec'y, c/o National Bureau of Standards, Washington, D. C.

## Classified Advertising

CLASSIFIED—Payable in advance. Rates under all headings, except "Positions Wanted," \$1.50 for first 25 words, five cents for each additional word. "Positions Wanted," 75 cents for first 25 words, five cents for each additional word. Bold face type five cents additional per word; capitals, also five cents additional per word. Box numbers for "Blind" advertisements, 50 cents additional for postage and handling.

## ● SPECIAL SERVICES

A FEW OPENINGS now available for watchmaking in a Certified Horological School by the H. I. A. Jes I. Hansen Practical School of Watchmaking, Denver, Colo.

HAIRSPRING VIBRATING—Same day service. Flat, \$1.75; Breguet, \$2.50. Fitted to bridge—leveled—poised—checked. Write today for mailing envelopes. CHARLES THOMAS & CO., P. O. BOX 330, Union City, N. J.

## ● HELP WANTED

WATCHMAKER — First-class, experienced man only; exper. with Timemaster, ctd'd man pfd.; good salary; permanent. Can provide lvg. qtrs. State age, experience and ref. ERNEST BURK, INC., 614 - 13th St., N. W. Wash. 5, D. C.

## ● SITUATIONS WANTED

**WATCHMAKER**, 30 years experience, wishes to take over repair department on a commission basis. Only reputable concerns on West Coast or South Atlantic states need reply. Box B1, H. I. A. JOURNAL, Indianapolis 4, Ind.

**WATCHMAKER**, 38 years experience, wants position. Moderate salary or will take over repair department on commission basis. E. J. Hall, 507 South Sixth St., Champaign, Ill.

## ● HOROLOGICAL BOOKS

**OLD - NEW**—Practical, Theoretical, Historical, all phases Watch and Clockmaking. Liberal estimates entire libraries, books, periodicals, embracing horological subjects. Advise requirements; or what have you? "HOROLOGIAN," 841 S. Park, Springfield, Illinois.

"**RULES AND PRACTICES** for Adjusting Watches" and "Practical Balance and Hair Spring Work," strictly practical books by Walter Kleinlein. Your jobber can supply these books.

**YOUR MONEY BACK** - If you do not agree that our method for tightening a slightly loose double roller is the best you ever heard of. And it is only one of 75 subjects covered.

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Here is concise information: 75 subjects; 25,000 words. The things you need to know every day. Card indexed, so you can learn one thing at a time. A big help to "on the job trainees." Sent postpaid on receipt of \$5.00. **REMEMBER**, your money back if you are not satisfied. **JAMES A. ESSER**, 3405 - 12th Ave., Tampa 5, Florida.

**WATCHMAKERS**—Increase your earning power. Increase your skill quickly and easily; 7th edition, "PRACTICAL BENCHWORK FOR HOROLOGISTS," by Louis and Samuel Levine; 20,000 copies sold. **FOR SALE AT ALL LEADING WATCH MATERIAL AND JEWELERS SUPPLY HOUSES. PRICE \$5.00.**

**JOSEPH BULOVA** School of Watchmaking Technical Training Manuals—\$5.00, including 1-year membership in the Horological Institute of America, Inc., 1 year's subscription to the H. I. A. JOURNAL. The **MANUAL** contains more than 250 pages of practical information on every phase of successful watch repairing and more than 600 accurate drawings. Send **COUPON**, on page 3, to Ralph E. Gould, Sec'y, H. I. A., c/o National Bureau of Standards, Washington 25, D. C.

## ● TRADE WATCH REPAIRING

**HIGH-GRADE WATCH REPAIRING** for the trade. Work time and checked on the WatchMaster. Satisfaction guaranteed. Complicated watches a specialty. 10-day service. Write for price list. **CURTIS V. HASKINS**, 1215 West 32nd Street, Indianapolis, Ind.

**BALANCE STAFF** to watch, \$2.00; order and balance staff, mainspring, \$4.00. Estimates and mail shipments solicited. H. L. Simon, Box 116-C, Central Islip, L. I., New York.

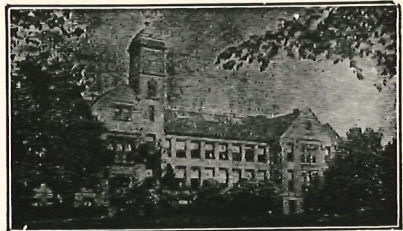
**RELIABLE WATCH REPAIRING** to the Trade. Prompt, efficient and dependable, guaranteed service. All work tested on "Time-O-Graf" instrument. **Robert A. Nicholson**, 415 State Life Bldg., Indianapolis 4, Ind.

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**FOR SALE**—1 to 3 WW and Moseley No. 2 wire chucks, JIH wire chucks, special, \$3.50; 4 to 10 inclusive, \$2.50, sizes and 1/2 sizes. Regular chucks, 1 to 80, \$1.50. Wheel chucks, \$1.75. Special watch and clock parts made to order. Several slide rests and wheel cutters and jewelry calipers for sale. Write for price list. Also a few openings for students who want to learn watchmaking. School certified by H. I. A. **JES I. HANSEN**, 331 Steel Building, Denver 2, Colorado.

**FOR SALE**—Long established jewelry store. Very good opportunity for a young watchmaker. Will sell at inventory price, or reduce stock to suit your pocketbook. Very good reason. Box 111, H. I. A. JOURNAL.



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An unusual offer is now being made, to wit:

One-year membership in the Horological Institute of America, Inc., the oldest national horological association.

One year's subscription to the H. I. A. JOURNAL, the official publication of the H. I. A.

The JOSEPH BULOVA School of Watchmaking Training Manual. All for \$5.00—the price of the Manual alone.

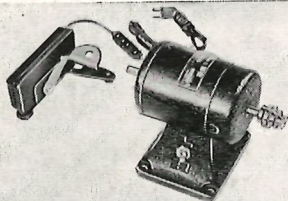
NOTE: If already a member, your membership will be extended one year from its expiration date.

At last the long-desired thorough, practical and comprehensive training program for horological students and watchmakers' apprentices, has been achieved in the JOSEPH BULOVA School of Watchmaking training manual.

This Watchmakers Training Manual, approximately 250 pages, contains more than 600 large detailed drawings and photos, illustrating with infinite accuracy every step involved on the successful servicing and repair of modern watches. The Manual is practically a "moving picture" solution of the every-day problems which horological students and watchmakers' apprentices encounter daily. It is also a valuable "refresher course" for the practicing watchmakers.

To mention a few of the subjects contained in The JOSEPH BULOVA SCHOOL OF WATCHMAKING TRAINING MANUAL, there are 54 pages of valuable information on hairspring truing, vibrating, colletting, and overcoiling, illustrated with more than 160 enlarged detail drawings; 29 pages with more than 70 illustrations on Balance Truing and poising; 26 pages of valuable information on Escapements, and their adjustments, supplemented with 34 clearly illustrated enlarged detail drawings; 43 pages of lathe instructions, removal of broken staffs, turning of staffs and stems, reduction and polishing of pivots, supplemental with more than 90 enlarged and easily understandable detail drawings. In addition to this brief summary of the JOSEPH BULOVA SCHOOL OF WATCHMAKING training manual, more than 100 additional pages with 240 detailed drawings and photos are included in this ideal training course.

FILL IN THE COUPON on Page 3 and mail today.



L&R LATHE MOTOR \$33.



L&R CRYSTAL GRINDER \$69.50



L&R FLEXIBLE SHAFT MACHINE \$50.



L&R SINGLE-SPEED POLISHING MOTOR \$25.

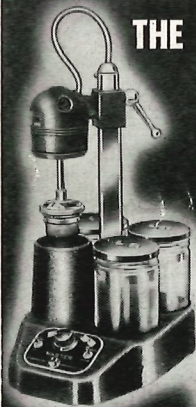


L&R FIVE-SPEED POLISHING MOTOR \$31.50

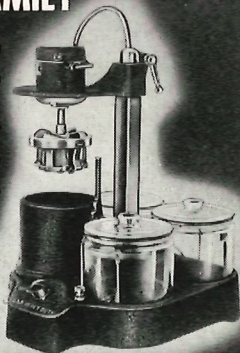


L&R BENCH TYPE FLEXIBLE SHAFT MACHINE \$51.50

## THE EVER-GROWING L&R FAMILY



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- L&R WATCH CLEANING AND RINSING SOLUTIONS Gallon: \$3.
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- L&R CONCENTRATE CLEANER 16 Fl. Oz. \$2.
- EFCO CLEANING AND RINSING FLUIDS Gallon: \$1.25



L&R DEMAGNETIZER \$7.



L&R ELECTRIC-LOUPE \$8.95



\$1.50

L&R MALLETS and HAMMERS \$1.

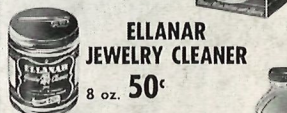


L&R RUST REMOVER 50¢

L&R SOLDERZIT 50¢



L&R WATCH CRYSTAL CEMENT 35¢



ELLANAR JEWELRY SERVICER

With Cleaning Tray 16 oz. \$1.



ELLANAR JEWELRY CLEANER 8 oz. 50¢

ELLANAR SILVER GLEAM 8 oz. 65¢ 16 oz. \$1. 32 oz. \$1.75

