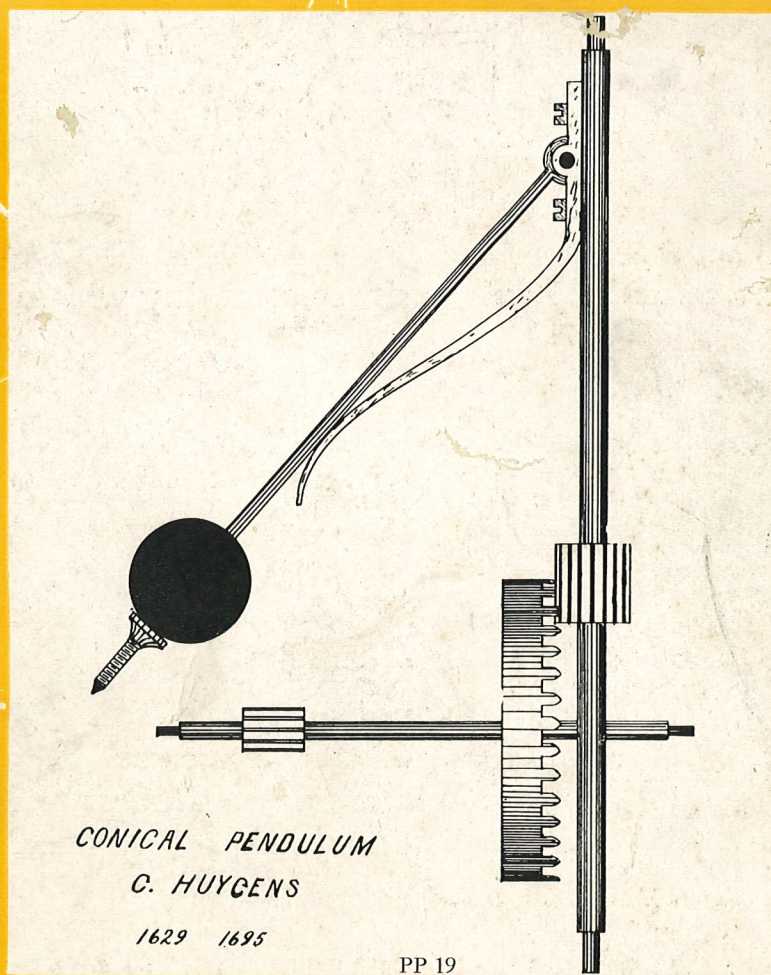


The H.I.A. Journal

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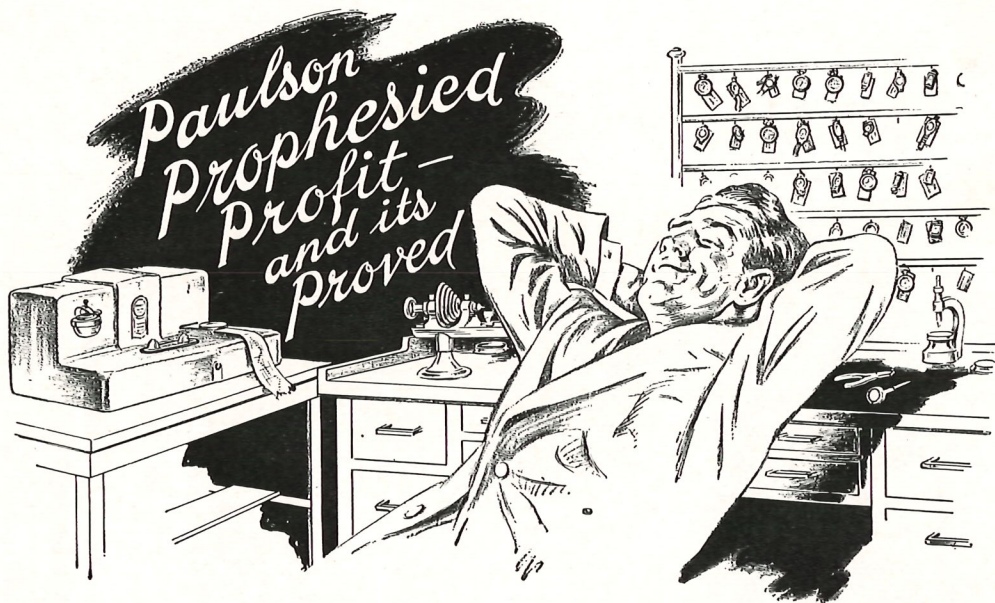
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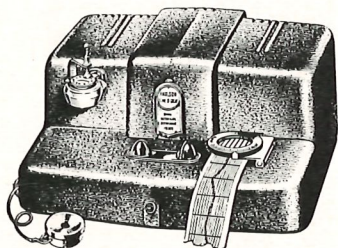


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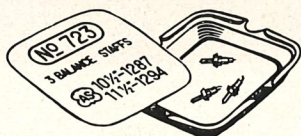
... Bulletin from The Watchmakers of Switzerland

NOW COMING YOUR WAY!

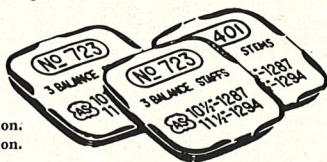
THE NEW OFFICIAL PACKAGE FOR SWISS WATCH REPAIR PARTS

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— These facts about the new Official — Package for Swiss Watch Repair Parts are important to you!

WHEN will the new Official Swiss Parts Package go into use? During the month of April, when your suppliers' stocks of *staves* and *stems* for the most widely used Ebauches movements will be replenished with packaged parts. He'll start filling your orders with these packaged parts as soon as complete national distribution has been made.

WHICH parts will be packaged? At first, only the *staves* and *stems* for the most widely used Ebauches movements shown in Part I of the new Official Catalogue of Swiss Watch Repair Parts. You'll receive advance notification as other parts are packaged. (Efforts are being made to have *all* parts packaged in the future.)

WHO will distribute the packaged parts? Your regular supplier! He'll fill your orders with the

packaged *staves* and *stems* just as soon as his present supply of genuine unpackaged *staves* and *stems* is exhausted. This gradual introduction is necessary, in order to obtain complete national distribution of the packaged parts to all watch repair departments.

WHAT is the difference between the Officially packaged parts, and the *genuine*, unpackaged parts you're now using? Very little. All genuine Swiss Watch Repair Parts are factory made to rigid specifications, and tested for accuracy. But when the part you get is packaged, you're *certain* that it's a genuine, factory tested part that will fit the movement.

SEE page four of this bulletin for more information on the new Official Swiss Parts Package.

The WATCHMAKERS OF



SWITZERLAND

... Bulletin from The Watchmakers of Switzerland (Cont.)

This is YOUR April ad—No. 12 in the great watch-selling series sponsored by the Watchmakers of Switzerland

Here's a preview of the Mother's Day Present that YOU are going to get!

YES, the ad on the opposite page is a Mother's Day present to *every* jeweler ... *every* watchmaker. It reaches millions of potential gift-buyers from coast to coast ... It reminds them that—for mother—no gift is more eloquent than a watch.

Mother's Day is one of 1949's really *big* gift promotions, and alert jewelers will be ready to make the most of this opportunity for *extra* business. This Mother's Day ad has been designed to help you do just that. Clip it from one of the magazines listed below, use its sales messages for selling points of your own (for example—stress the point that *early* gift buying allows time for engraving) ... build your merchandising around it ... use it for a

window, or counter card ... tie it in with your own Mother's Day watch displays.

Remember that advertising like this appears over the signature of the Watchmakers of Switzerland *every* month in the year. It makes the most of special occasions; *and* it helps you get more business during the "in-between times." What's more, in all these ads, the importance of good watch repair is explained and your customers reminded that—no one is more competent to repair a watch than a jeweler.

So, keep your eye on these ads. Make the most of them in every way. And, if you'd like, write to The Watchmakers of Switzerland at 730 Fifth Avenue for permission to use the slogan that appears in every ad.

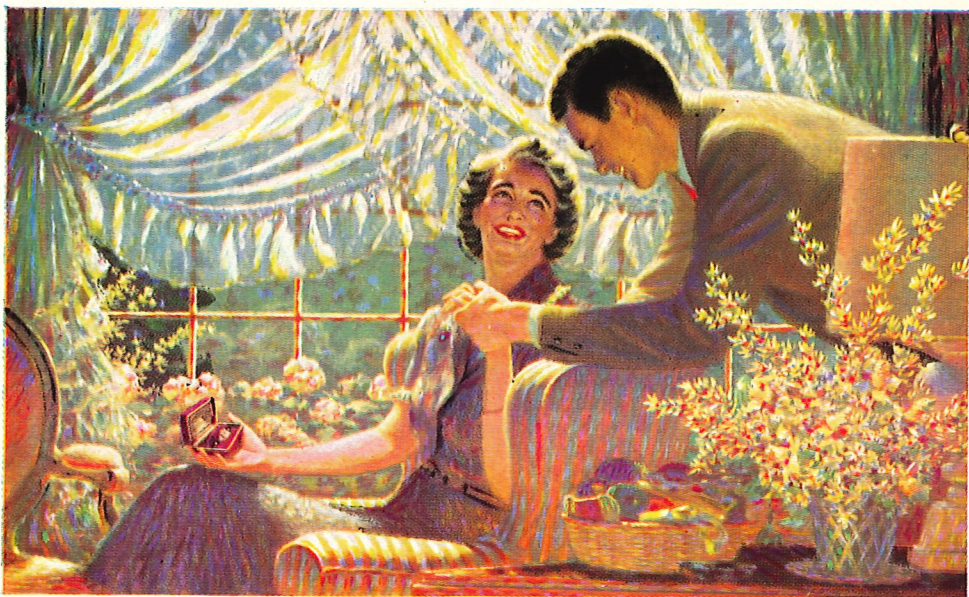
**For the gifts you'll give with pride—
let your jeweler be your guide**

The WATCHMAKERS OF



SWITZERLAND

**DURING APRIL, THIS CAMPAIGN WILL MAKE 73,087,271
READER-IMPRESSIONS IN LIFE, LOOK, SATURDAY EVENING
POST, TIME, NEWSWEEK, AND COUNTRY GENTLEMAN**



1. It won't be long till Mother's Day—May 8th. And no gift is more eloquent than a watch, no gift tells her so well that the faith and love and time she's lavished on you do not go unrecorded in your heart. Shop for Mother's watch *now*, while there's time to have it engraved. And, when you choose, remember that the best—in beauty, in accuracy and in value—is a jeweled lever Swiss watch.

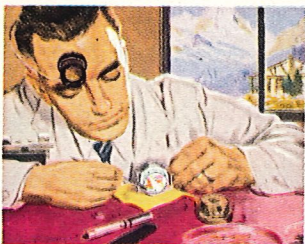


2. The watch you buy today reflects the traditions handed down by generations of Swiss craftsmen and watchmakers. The trend toward watches as pieces of jewelry is inspired by the wonderful jeweled lever watch movements that come from Switzerland.



3. Many new styles are now available, priced to suit every purse—from sports watches (some water-resistant and even self-winding) to beautifully feminine fashions. As always, the Swiss lead in bringing out new ideas in watch design and performance.

What you should know about the watch you'll give to Mother



4. Swiss craftsmen developed the first wrist watch. The first self-winding watch was built by a Swiss in Marie Antoinette's time. And the jeweled bearings that make modern watches run so accurately were first used in Switzerland in 1704. Talent like this is still working in your favor when you buy a jeweled lever Swiss watch.



5. You can't beat the Swiss when it comes to building good looks, good service and good value into a watch. To give the best wear, a good watch deserves an expert's care. And, today—no matter what the make—your watch can be serviced economically and promptly, thanks to the efficiency of the modern jeweler.

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

The WATCHMAKERS OF SWITZERLAND

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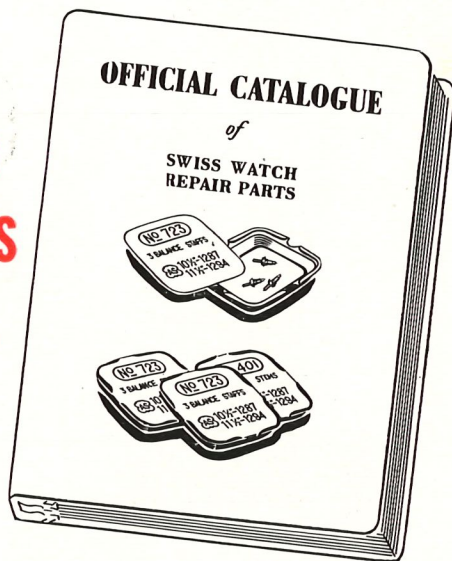


... Bulletin from The Watchmakers of Switzerland (Cont.)

The New Official Package for Swiss Watch Repair Parts Makes YOUR Work Easier!

You get the right parts, faster, thanks to the Official Package for Swiss Watch Repair Parts. Staffs and stems for the most widely used Ebauches movements are now being packaged and the work of filling orders, checking orders, and inspecting the parts is now tremendously simplified.

The Official Catalogue and the Official Swiss Parts Package work together. When you use both the catalogue and the packaged parts, you help to make sure of getting genuine, Official Swiss Watch Repair Parts. And the new package is identified according to the system set up by the Official Catalogue.



Be sure to use the Catalogue for ordering *all* parts. Even though the part you order may not be packaged as yet, you should employ the identification and ordering system set up by the Catalogue. Your dealer is already doing so, and it makes your own work simpler. And remember that your dealer will use his stock of genuine unpackaged staffs and stems, while the packaged parts are being distributed.

The new Official Swiss Parts Package is one more phase of the great Official Swiss Watch Repair Parts Program, which now includes . . .

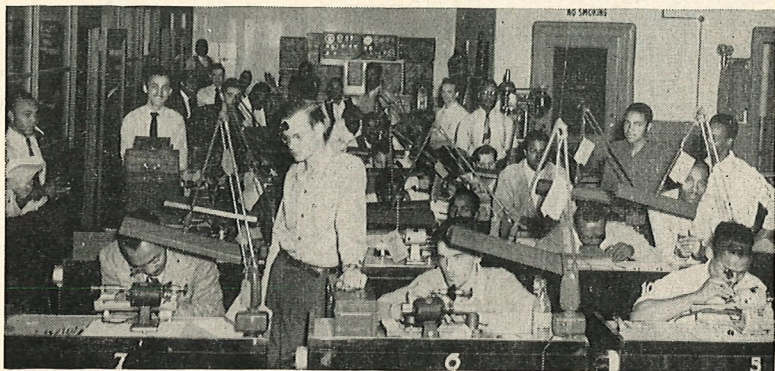
1. The Official Swiss Watch Repair Parts Information Bureau, located at 730 Fifth Ave., New York, N. Y. is ready to answer your questions and be of service to you.
2. The Official Catalogue of Swiss Watch Repair Parts (Part I), covers all parts of Ebauches movements; sets into operation a new, standardized method of identifying and ordering Swiss Watch Repair Parts. It's easier for you!
3. The Official Dictionary of Watch Parts defines and illustrates all parts of all Swiss watches. Watch terms are given in English, Spanish, French, and German. You can order your copy from this magazine for only \$4.50.
4. The new Official Swiss Parts Package. Made from heavy foil, sealed against moisture and corrosion, completely labeled for quick and easy identification. Genuine parts in factory perfect condition!

We extend our hearty thanks to the Associations, Importers, and Wholesalers, for the fine cooperation they have given in the operation of the Official Swiss Watch Repair Parts Program and for making possible the introduction of the new Official Package for Swiss Watch Repair Parts.

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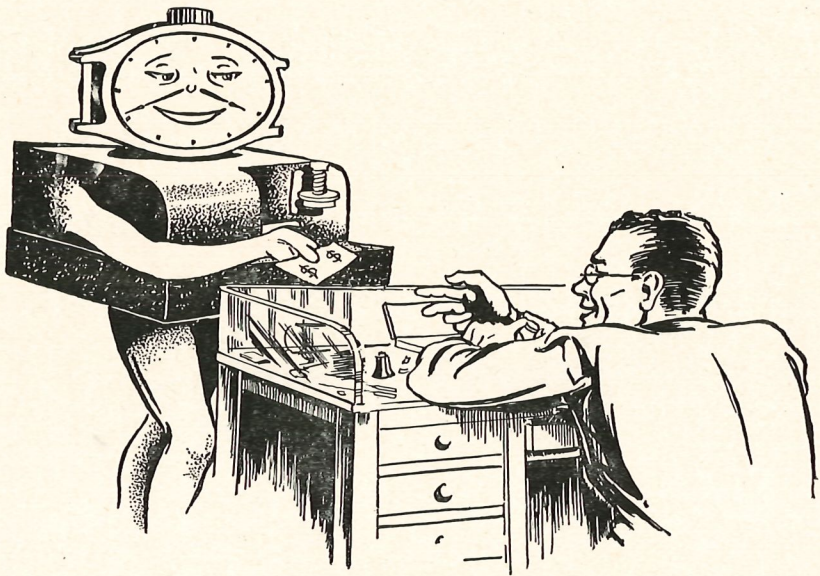
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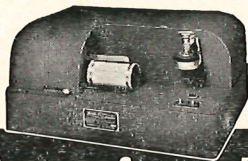
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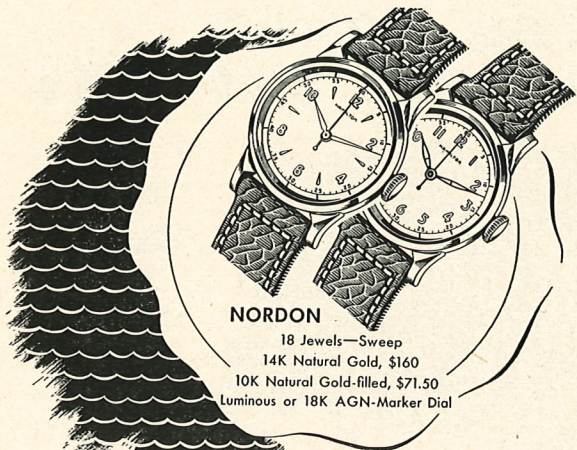


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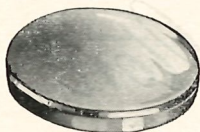
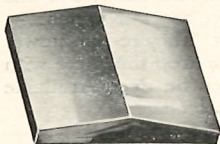
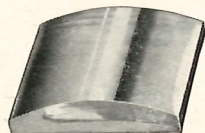
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JOURNAL

DEDICATED TO THE PROGRESS
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Number 10

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TABLE OF CONTENTS



Article	Page
The Atomic Clock (Part 2).....	7
Basic Points for Operating a Successful Watch Sales and Service Department.....	15
New York Horos Vote to Aid Legislation.....	17
U. S. Watchmakers Testify in Congress.....	18
Student of Beehler School Builds Watch.....	18
Gruen Watchmaking Institute Student Has Unusual Hobby	19
March Cover Page Story.....	19
Forgotten Men of World War II Remembered by Leeds	22
New Tennessee Watchmakers Guild Formed.....	27
"The Half Century Club".....	29
Your Questions Answered Here.....	32
A Training Program for Apprenticed Watchmakers....	35
More Watchmakers Certified.....	43
W. H. Brandes Appointed Manufacturing Director of Elgin.....	46
"As the Pendulum Swings".....	49

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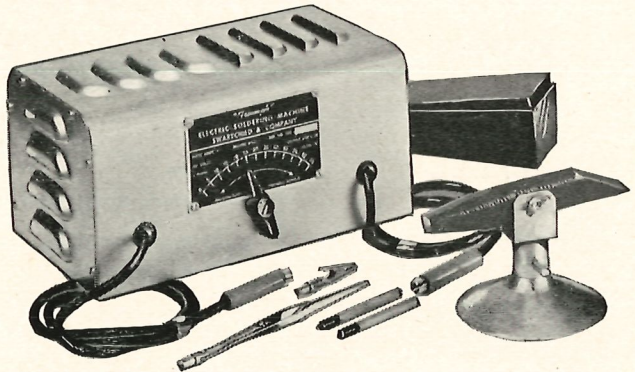
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New Streamline Model

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We are pleased to offer you the latest Triumph soldering machine developed after many months of engineering research. This compact, efficient, portable machine which measures 10½"x6"x5½" weighs about fifteen pounds and, therefore, while not massive in size is sufficiently heavy for enduring use.

The machine comes to you complete with portable carbon stand, foot control switch, cables and carbon holders as well as one large carbon, two pencil carbons, locking type tweezers and small alligator clip as well as simplified operating and soldering instructions.

The machine is calibrated from 0 to 60 amps and 25 separate heat switches ranging from the lightest work to heavy gold and silver rings. One of the many advantages of the Triumph soldering machine is that there is no arc or pitting. The heat developed at the pencil carbon is equal and intense. It operates from any 110 volt, 50-60 cycle AC line. Tests in our laboratory have been made over a wide period of time and the utmost success in all forms of jewelry, optical and other small types of soldering is guaranteed as well as medium heavy work. The machine will handle gold, silver, platinum and stainless steel work as well as being adapted to soft solder by merely using the carbon pencil in place of the soldering iron.

The modernistic design and construction of the case insures against overheating while the machine is in operation. With careful use this machine should last you a lifetime as there are no moving parts, nothing to wear out, nothing to get out of adjustment.

No. R5330849. Complete with Equipment \$23⁹⁵ and Instructions

THE ATOMIC CLOCK

An Atomic Standard of Frequency and Time

EDITOR'S NOTE: This is the concluding installment of "The Atomic Clock, an Atomic Standard of Frequency and Time" article featured in the February issue of The H. I. A. Journal.

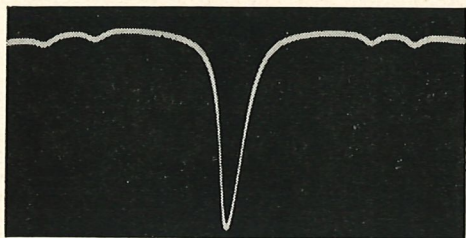


Figure 3.

While the NBS Atomic Clock is in operation, the monitoring oscilloscope continuously displays a trace of the 3,3 absorption line of ammonia. The 3,3 line, strongest of many absorption lines in ammonia, corresponds to the quantum transition in which the quantum numbers J and K both have the value 3. The symmetric output pulse is produced by absorption of the FM control signal as it sweeps across the natural absorption-line frequency of the ammonia gas. The sharpness of this line on the oscilloscope screen is an indication of the time-keeping accuracy of the atomic clock. A frequency scale may be inferred from the known frequency interval (1.74 Mc) between the main 3,3 pulse and the first satellite pulse on either side (the satellites are produced by nuclear quadrupole moments of N^{14}). This shows that the width of the 3,3 absorption line at the half-power points is about 0.335 Mc; dividing the center frequency (23,870 Mc) by this half-power value yields a Q of 71,200.

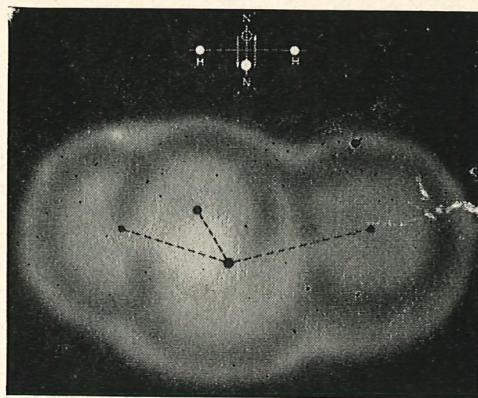
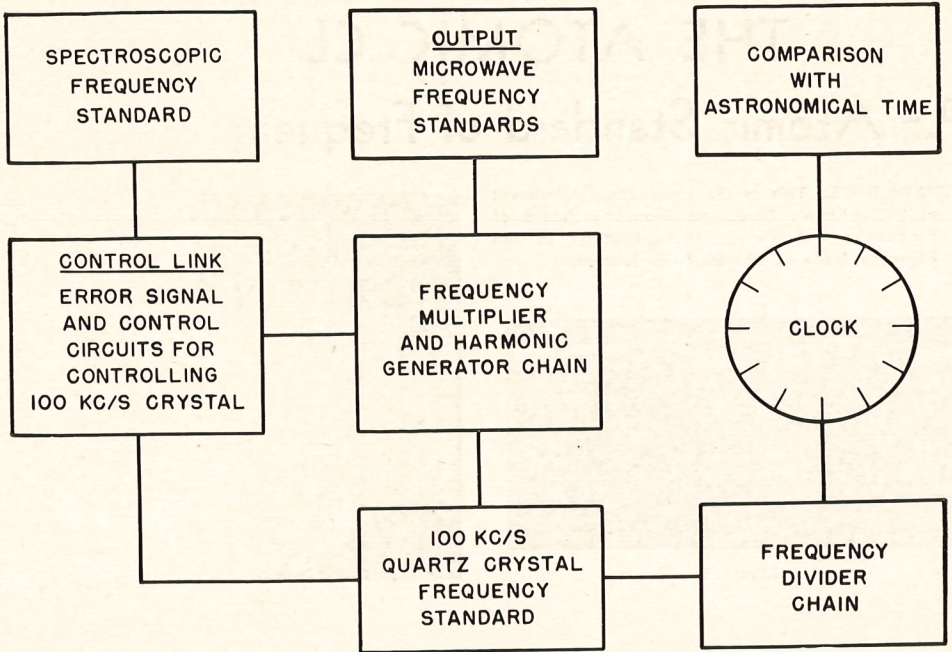


Figure 4.

The quantum transition by which the ammonia molecule (top), NH_3 , absorbing energy at one sharply defined frequency, can turn itself inside out is illustrated in classical terms by the schematic diagram (bottom). An absorption line produced by such a transition serves as the frequency control for the NBS Atomic Clock. The ammonia molecule is in the form of a pyramid with a nitrogen nucleus at the apex and three hydrogen nuclei at the base; each nucleus is surrounded by its characteristic electron charge. The Average distance between the nitrogen nucleus and each hydrogen nucleus is 1.01 Angstroms; that between the hydrogen nuclei is 1.63 Angstroms. The pyramid is about 0.38 Angstroms high, and the H-N-H apex angle is 107° .

Simplified block diagram of the National Bureau of Standards Atomic Clock. The fundamental driving signal originates in the 100-kilocycle quartz-crystal oscillator. The frequency-multiplier and harmonic-generator chain then multiplies this signal up to microwave frequencies by means of vacuum-tube circuits and silicon-crystal diodes, providing output signals throughout



SIMPLIFIED BLOCK DIAGRAM OF NBS ATOMIC CLOCK
FIGURE 5.

the microwave range. Frequency-discriminator circuits in the control link then compare the frequency of these signals with the ammonia frequency standard. After the microwave signal is exactly tuned to the frequency of the spectrum line, any tendency to drift on the part of the quartz-crystal oscillator will cause the discriminator

circuits in the control link to send an "error signal" back to the oscillator, maintaining it at the proper frequency. The crystal oscillator is thus locked to the invariant frequency of the ammonia line. A frequency divider chain then drives a synchronous-motor clock, first reducing the stabilized 100-kilocycle signal to the clock frequency.

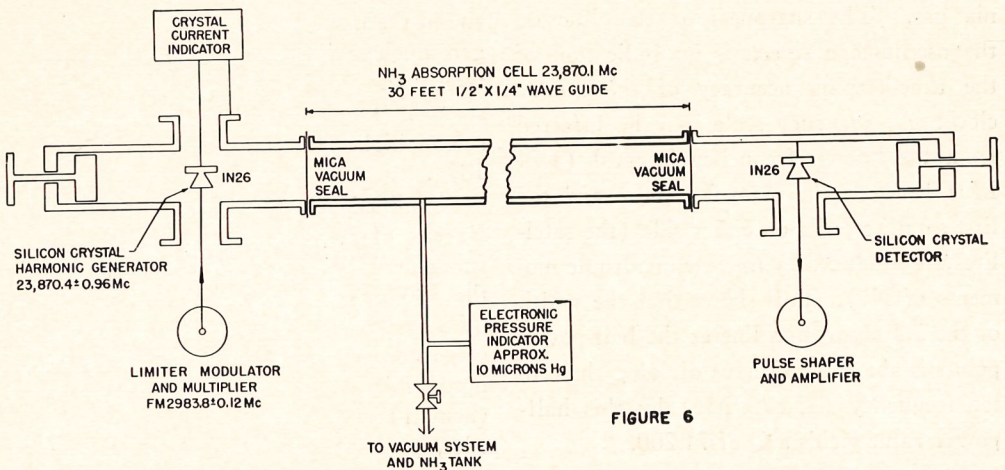
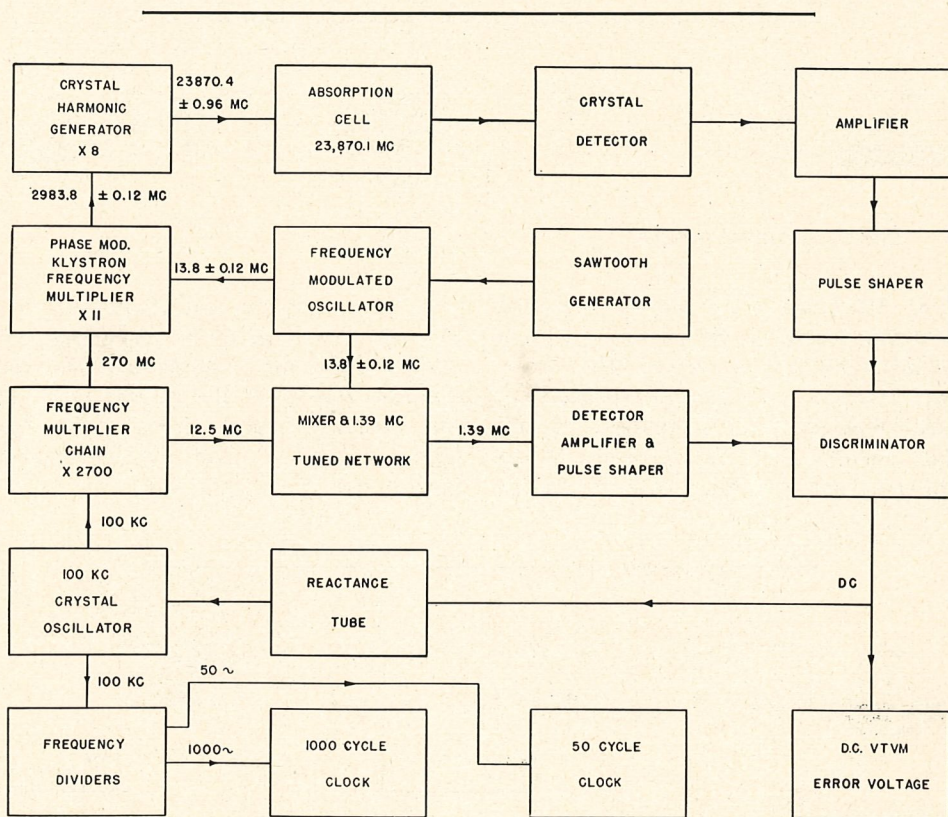


FIGURE 6

The waveguide absorption cell used in the NBS Atomic Clock is a rectangular copper tube wound in a compact spiral and provided with mica windows to seal in the ammonia gas at reduced pressure. A 2983.8-megacycle signal is fed through a coaxial cable to a type-1N26 silicon-crystal rectifier inside the waveguide. This crystal rectifies the input current and generates strong harmonics which radiate down the waveguide. Tuning plungers are shown at the input and

output of the cells for impedance matching so that all of the signal is used and none reflected. The present 39-foot cell gives a two-to-one total reduction in signal amplitude. After passing through the absorption cell, the signal is received by another type-1N26 silicon-crystal rectifier, acting like a receiving antenna, generates an output current which dips due to absorption as the input frequency sweeps across the absorption-line frequency.



COMPLETE BLOCK DIAGRAM OF NBS ATOMIC CLOCK
FIGURE 7

The fundamental driving signal for the NBS Atomic Clock originates in the 100-kilocycle quartz-crystal oscillator (lower left). A frequency-multiplying chain using ordinary radio tubes multiplies the signal up to 270 megacycles; a frequency multiplying klystron then multiplies the signal

11 more times and combines it with a signal from a frequency-modulated oscillator to produce an FM output signal at 2983.8-0.12 Mc. A silicon-crystal harmonic generator multiplies this FM signal up to 23870.4-0.96 Mc and introduces it into the ammonia absorption cell. As the fre-

quency of the modulated control signal sweeps across the absorption-line frequency of the ammonia vapor, the signal reaching the silicon-crystal detector at the end of the absorption cell is decreased, giving an output pulse which is strengthened and sharpened in the amplifier and pulse shaper. A second pulse is generated by combining in a mixer the output of the FM oscillator and a 12.5 megacycle signal from the frequency multiplying chain. The time interval be-

tween the pulse from the absorption cell and the pulse from the mixer can then be measured in the discriminator. The discriminator gives zero output when the time interval is right; but when the interval is wrong, it sends a control signal to the reactance tube, which retunes the crystal oscillator accordingly. The crystal oscillator is then stabilized against drift and can maintain the timekeeping of the synchronous-motor clocks with extreme accuracy.

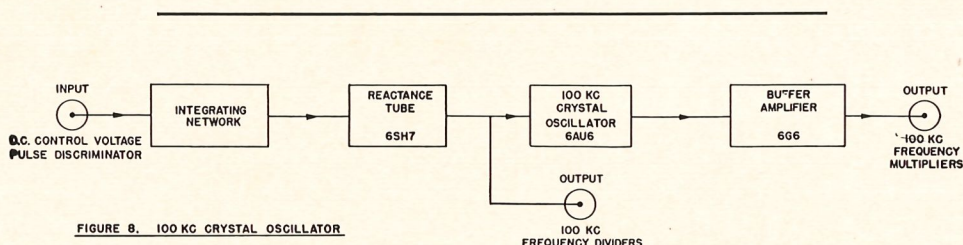


FIGURE 8. 100 KC CRYSTAL OSCILLATOR

The 100-kilocycle frequency standard employs a quartz-crystal oscillator with a reactance-tube control circuit. The "error signal" from a frequency discriminator is passed through the integrating circuit, which smooths out all fluctuations in the error signal except steady changes generated

when the circuit tries to drift in frequency. The output voltage of the integrating circuit, applied to the reactance-tube grid, controls the tuning of the crystal oscillator. The oscillator output is fed to a frequency divider and also, through the buffer amplifier, to a frequency multiplier.

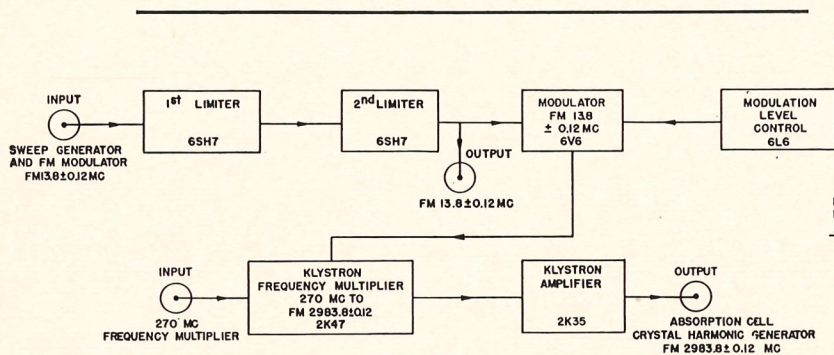


FIGURE 9. LIMITER, MODULATOR, AND MULTIPLIER

The limiter, modulator, and multiplier arrangement uses a klystron tube to multiply the 270-megacycle input signal 11 times before combining it with an FM signal of 13.8 ± 0.12 Mc. The resulting output signal, 2983.8 ± 0.12 Mc, is then amplified in

another klystron and fed to the harmonic generator at the input of the ammonia absorption cell. Klystron tubes are used here because of the extremely high frequencies involved.

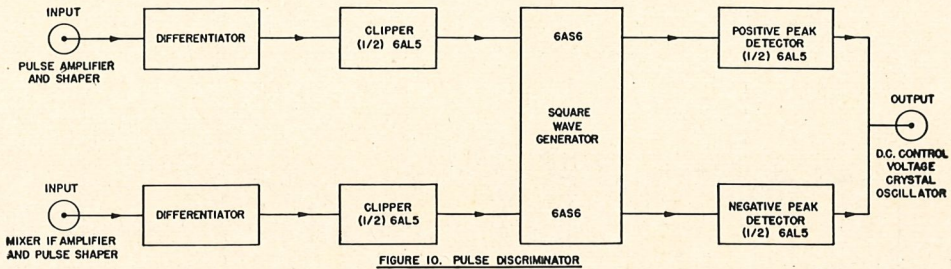


FIGURE 10. PULSE DISCRIMINATOR

In the pulse discriminator, the two pulses between which the time interval is to be measured turn a trigger circuit or square-wave generator on and off. When the time interval is correct, the on-off cycle generates no output signal, from the positive and negative peak detectors driven by the square-wave signal. The detectors draw current on the positive and negative peaks of the square wave, but when the positive and negative portions of the square wave are of equal duration, they balance and give

no d-c output. However, if the time interval between the two input driving pulses gets longer or shorter, the relative duration of the positive and negative parts of the square wave changes so that a resultant d-c output is generated. No control voltage is generated when the quartz-crystal oscillator is on the proper frequency to tune the frequency-multiplying chain to the ammonia line, but a control voltage is produced to retune the oscillator if it is tending to drift.

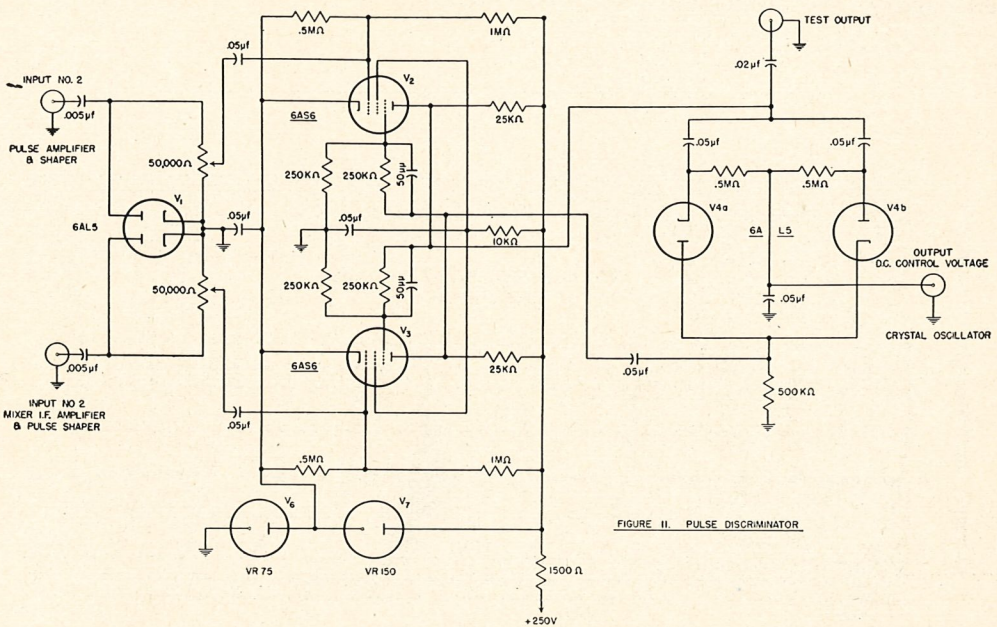
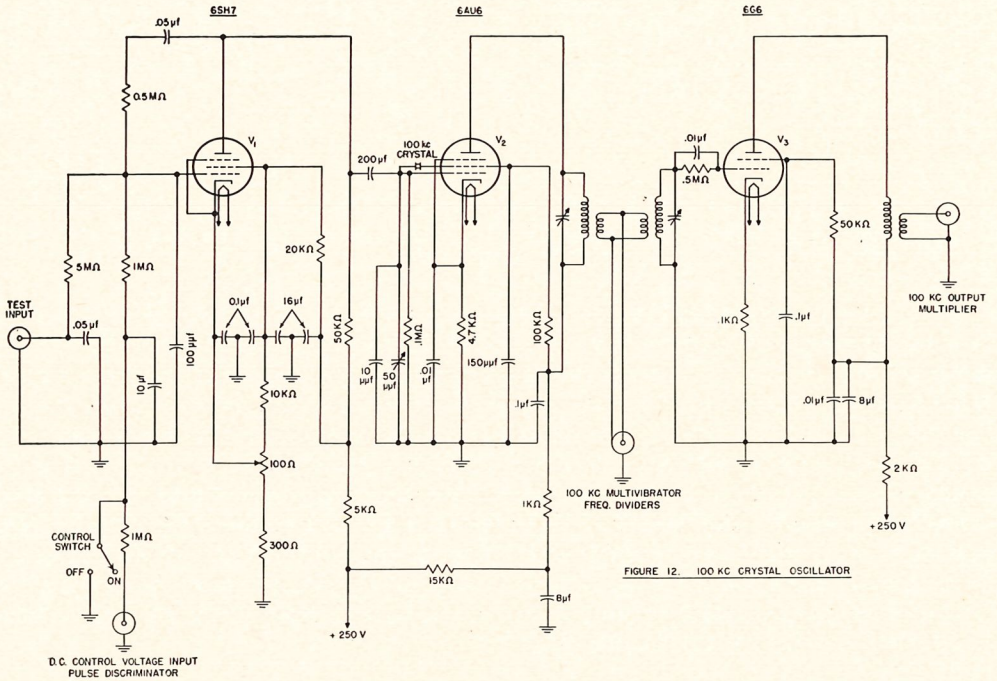


FIGURE 11. PULSE DISCRIMINATOR

Figure 11



Figures 11 and 12.

Schematic circuit diagrams of the pulse crystal oscillator used in the NBS Atomic discriminator and the 100-kilocycle quartz-Clock.

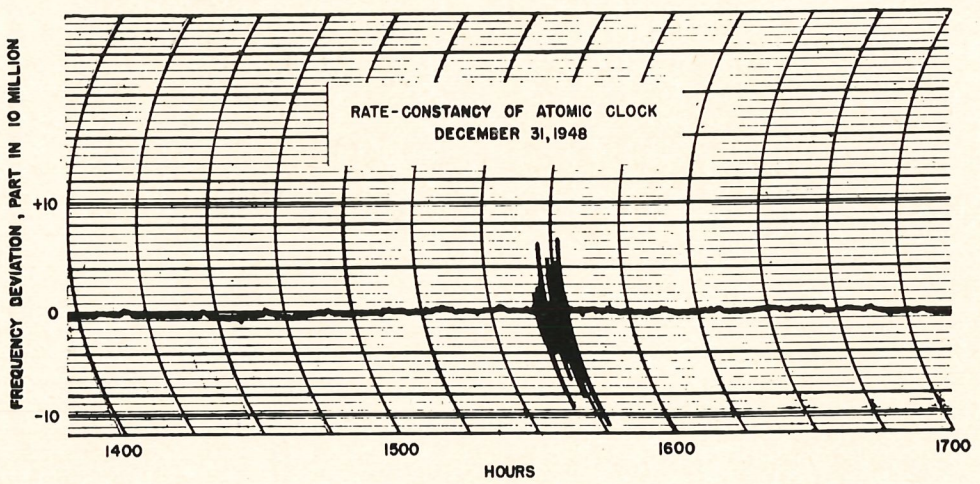


Figure 13.

The rate-constancy of the NBS Atomic Clock in terms of its frequency deviation in parts per ten million shows the timekeeping accuracy during an actual test run. The narrow portions of the deviation trace, recorded while the clock was locked to the

ammonia absorption line, indicates a constancy of better than one part in ten million. When the control circuit was unlocked, large frequency variations occurred, as shown by the broad part of the recorder trace.

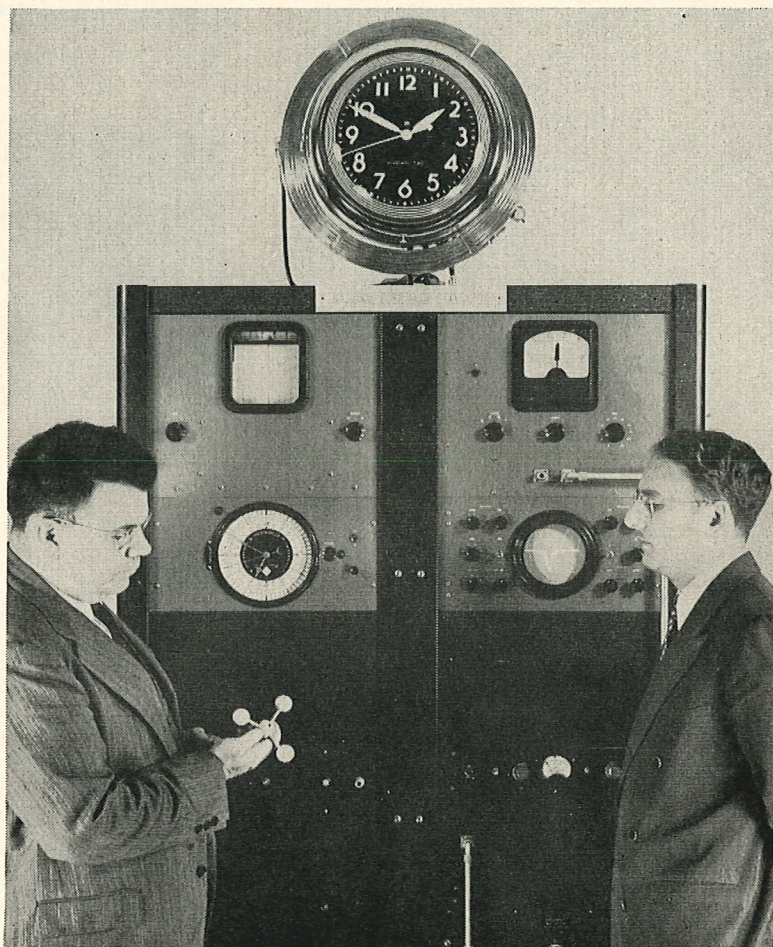


Figure 14

Dr. E. U. Condon (left), Director of the National Bureau of Standards, and Dr. Harold Lyons, inventor of the NBS Atomic Clock, stand before the control panel of the clock. Dr. Condon is holding a model of the ammonia molecule whose microwave absorption line (shown on the oscilloscope

screen at right) provides the invariant frequency which controls the timekeeping of the clock. The ammonia gas is maintained at low pressure in the 30-foot absorption cell wound around the synchronous clock (directly above the scientists).

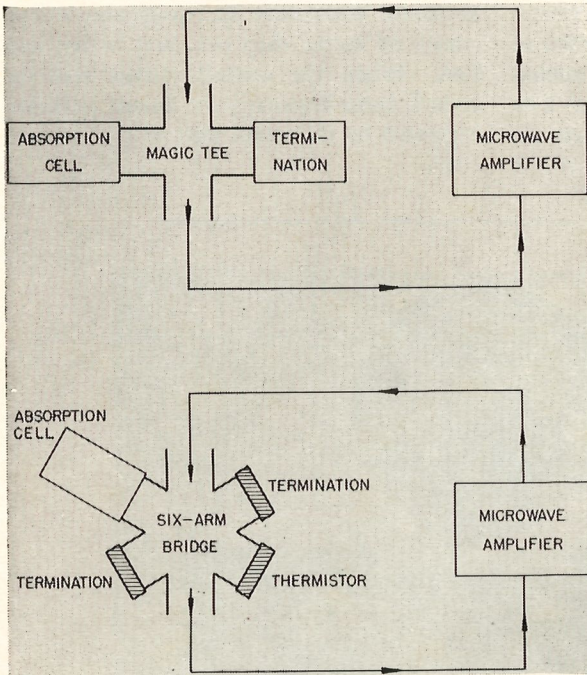


Figure 15

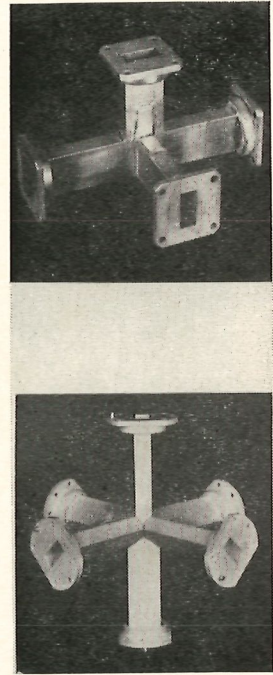


Figure 16

Atomic oscillators for frequency control applications in the microwave region, where quartz-oscillators cannot be used, are now being developed in the NBS microwave standards laboratory. One such oscillator, for use in transmitter control and for making atomic clocks and frequency standards without using discriminator circuits, employs a waveguide assembly known as the magic tee (Fig. 15). Feedback through the magic tee to the microwave amplifier occurs only at the resonant frequency of the gas in the absorption cell. The tee is balanced at other frequencies, but at resonance the absorption unbalances the circuit so that a signal is passed through to the amplifier,

causing it to oscillate at the absorption-line frequency. Another atomic oscillator will be similar to the magic-tee type but will use a six-arm waveguide bridge (Fig. 16) to control the amplifier feedback. This design should largely eliminate effects of the external circuits on oscillator frequency. Analogous circuits at low frequencies, using quartz crystals in a bridge arrangement, are employed in the most precise crystal oscillators so far constructed. Thus, the six-arm bridge waveguide oscillator, controlled by the absorption line alone, should be especially suitable for primary atomic clocks and frequency standards.

CHRONOGRAPH (*kronn o-graff*): An instrument used for recording time signals on a paper-covered rotating cylinder. (2) A watch with center-seconds hand which may be started at zero, stopped to record

the time of an event, then returned to zero by operating a button on outside of watch case, besides the ordinary hour and minute hands.

Basic Points for Operating a Successful Watch Sales and Service Dept.

By BENJAMIN MELLEHHOFF

EDITOR'S NOTE: *Volumes have been written on the theoretical and practical servicing and repairing of timepieces, but little has been written about the need for or the value of customer goodwill as it concerns the selling of new watches and their maintenance in a satisfactory timekeeping condition, after they are sold.*

This is the second of a series of articles by Benjamin Mellenhoff, a well-known watchmaker, of New York City.

Mr. Mellenhoff is well qualified by experience and training to write intelligently on this important, but neglected subject. He spent three years in the St. Petersburg (Russia) Watchmaking School, under the auspices of Prince Ollenburg; has been employed in the E. Howard and Hamilton Watch factories; service department manager of several famous New York retail jewelry establishments, and has operated his own retail store. He is a Past President and Honorary Member of the Horological Society of New York; a certified H. I. A. Master Watchmaker and an Honorary Member of the Horological Institute of America, and the H. I. A. Journal Half-Century Club.

WATCH REPAIRS—ARTICLE TWO

There are two fundamental principles involved in conducting a successful watch repair business: (1) good work, (2) the proper and just price for good work.

Now, let us discuss good repair work. When I say good work, I mean that the watch should be in A-1 condition when you deliver it to your customer. A good job means not the immediate money derived from the repair, but building up your name and reputation as a good craftsman. Each good job delivered means future revenue brought to you by every satisfied customer.

When a customer comes in to your store or shop, stating that his watch stopped functioning and probably needs cleaning, don't peep into it for a few seconds and tell him that is so, and the price will be so much. Let us assume the customer agrees to pay for the job.

Then the time comes for you to do the job. You take the watch apart and find a cracked train jewel, badly cut train pivots, etc. Now, if you are a good workman, you know well that damaged parts must be replaced. Right here, you are licked! The cost of replacing damaged parts and the time required to fit them will leave you very little from the charge made to the customer. That is one unfortunate aspect faced

by many small stores, which explains why they don't make progress even after a number of years. First of all, even if you are a good workman, you don't know the condition of the movement inside unless you have taken it completely apart.

For many years, the jewelers themselves have fed the public two unfortunate slogans: "Your watch needs cleaning" and "We guarantee our watches". Every good workman will agree with me that a watch needs overhauling, pivots polished, balance examined for poise, a set mainspring replaced, a pitted cap jewel replaced, etc., and finally retiming the watch to 2-3 or more positions—all this means *overhauling, not cleaning.*

If you tell your customer that his watch needs cleaning, he will be under the impression that it is a process similar to cleaning a suit or hat, or a lady might compare it to cleaning a pair of gloves. Tell the customer that his or her watch has to be taken apart, that after all it is an intricate little engine which derives its motor power from a steel mainspring. Every part has to be checked carefully and repolished. After all this has been done, then each part is carefully cleaned and reassembled. The actual cleaning of the watch is done *after* the parts were handled in checking and correcting.

To gain greater confidence from the public and assure yourself of a just price for repairs, ask the customer who brings in a better grade watch to leave it for a thorough examination and an estimate will be submitted. Nine times out of ten you will win the owner's trust.

Now, how about the medium grade watches? Most customers demand a price across the counter. In that event, take the movement out of the case, remove the balance, examine the pivots, note the condition of the hairspring and escapement, and as far as you can see. Then, say this to the customer: "As far as I can see, the watch needs overhauling, and it will cost *approximately* \$7.50. However, should I find that there is more to be done than regular overhauling, I shall notify you before proceeding with the work." Here again, the customer will trust you.

Never make any "funny" estimates by telling the customer his watch needs a balance staff, or the pivots are bent, or jewels are cracked, because he may have been at your competitor's store across the street where his watch had been examined carefully, and told it needed only overhauling. He will surely take his watch away from you and leave your place in disgust. One-half dozen or more customers like him will doom you.

Never try to make "catch as can" prices, but get a just price for your repairs. If you value your good name, have a fixed price for overhauling ordinary watches of approximately \$3.00 minimum per hour. I cannot set any price on chronographs, splits and minute repeaters—you will have to deal with each watch on its merits.

There are many small stores or shops that have timing machines. Some even display them in the window with signs to attract customers; others keep them on a showcase. When a customer comes in with a prospective repair, some jewelers immediately run to the machine with the watch. Thus, by misrepresentation and inconsistent statements, they will chisel \$2.00 or \$3.00 more

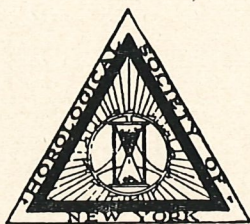
on the repair job. Please don't do this! This scientific instrument was not intended for that purpose. It was developed for you only and not for chiseling purposes. As a matter of fact, it should not be kept on display for customers. You will also avoid trouble and embarrassment should you have a high grade watch originally adjusted to 5 or more positions, if you or your assistant have had no experience or knowledge about position work. Yet, a timing machine may expedite your repair work, particularly where there are a great many medium repairs. But remember, the watch must be in A-1 condition before you use the machine. Don't blame the machine if your watch has not been repaired properly.

After having tested the watch on the timing machine and obtained a satisfactory record in 3 or more positions according to the grade of the watch, I advise you not to put it away and say this job is finished. Hold it for 3 or more days and be convinced that the watch is right, and the timekeeping checks with the record on the machine. As I stated above, the machine is a fine scientific development and a great help, but please do not abuse it.

In conclusion, I am going to relate an interesting true fact. I paid a visit to a friend of mine who has a small jewelry store. He is the type of watchmaker that I would classify as a "would-be artist". He has never progressed in craftsmanship, and for the many years he has been in business has made just a living from cheap work. Most of his repairs are sent out to a second rate trade shop. One day, I noticed that he had a small box on his showcase. I asked him if this was supposed to be a timing device. He replied in the affirmative. So I said, "You have to use a good timekeeping watch with it." Again he agreed. I asked him to let me see the watch. He showed me a 16 S. Waltham 17 J. movement. I compared it with my watch and told him that his watch was over $1\frac{1}{2}$ minutes slow, and how could he regulate his work? Well, he was honest with me. He told me that it

was only to put on a front with his customers about the good work he was doing and how he regulates his watches. I asked him why he didn't install a reputable machine. He replied, "Well, a good machine will register on paper, and when the customer will see the record of his watch, that will be my finish. This way, I tell him a flash here, a flash there, and the watch is regulated." I myself could not make out the flashes due to their inconsistency, because his 16 S. Waltham watch was not in order.

The third article will follow in the next issue.



NEW YORK HOROS VOTE TO AID LEGISLATION

The Horological Society of New York has appropriated from its treasury \$500 to aid the New York State Watchmakers Association in its legislation program to obtain enactment of laws favorable to better horological activities in the Empire State.

Four individual members have also donated \$200 to the state association to aid it in carrying forward its legislative objectives. Andrew Park, president of the society; James J. O'Shaughnessy, former president; Jean L. Roehrich and Teddy Taus of the Taus School of Watchmaking, were the four donors to the fund.

At the January meeting of the society, speakers who discussed the legislative program included Henry B. Fried, Paul Roth, Henry Morriss and Barney Goldstein.

Plans for carrying forward discussions of important horological problems during the year have been completed. Panels of

authorities will be selected for programs similar to radio's "Information Please." Training films of the Bulova School of Watchmaking will also be shown.

Members of the executive committee are working on details of a plan to amend certain by-laws of the society, and President Park has announced that discussion will be held at each executive committee meeting to modify the constitution and by-laws of the society. When the by-laws have been brought up to date in revised form, copies will be printed for distribution to all members, he announced.

The new book of Henry B. Fried, executive secretary of the society, "The Watch Repairer's Manual," published by D. Van Nostrand Co. of New York, is off the press now. It is a book of 307 pages with approximately 375 illustrations. It is now offered for sale in book stores and supply houses.

Other horological authors, who are members of the New York Horological Society, include Dr. Arthur L. Rawlings, author of "The Science of Clock and Watches"; John Bowman, author of "Modern Watch Repairing"; Dr. Karl Vogel, "What Is Time?"; Hope Jones, "Electrical Time-keeping"; Walter Kleinlein and Howard Beehler, authors of various technical works.

Swartchild Offers Improved Soldering Machine

The 1949 TRIUMPH soldering machine is streamlined in appearance, engineered for enduring efficiency and is supplied with complete equipment and accessories.

It has 25 separate heats to handle every type of soldering job for the jeweler, watchmaker or optician. The unusually low price is in line with the company's policy of maintaining leadership in offering utmost value. The machine is advertised on page 6 of this issue.

U. S. WATCHMAKERS TESTIFY IN CONGRESS

Representatives of American watch manufacturers have urged members of the House Ways and Means Committee to name a sub-committee for careful study of the problems facing their industry. James G. Shennan, president of the Elgin National Watch Company, who testified in behalf of American watch makers before the committee, recommends an "equitable tariff protection" for them.



Washington, D. C.—James G. Shennan (at microphone), president of Elgin National Watch Company, testifying before House Ways and Means Committee during recent hearings on extension of Reciprocal Trade Agreements Act.

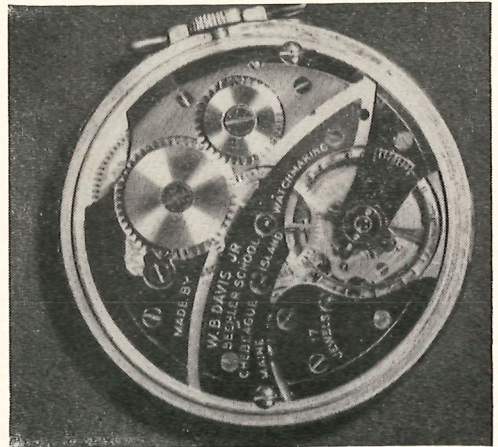
R. W. Kant, president of Hamilton Watch Company, backs up Mr. Shennan on the need of the appointment of a sub-committee in the House to check up on changing economic conditions affecting the present tariff act and report accordingly to the Committee.

Both officials want steps taken to preserve and expand the American watch industry in the interest of public security.

CENTER DISTANCE: Distance measured between the exact centers of motion of a pair of gear wheels, or a wheel and pinion, that work together. This measurement is equal to the sum of the pitch-circle radii of both members of the gearing, and each radius is proportional to the number of teeth or leaves in its wheel or pinion. The heights of addenda are of course not included in measurement of the center-distance.

Student of Beehler School Builds Watch

W. B. Davis, Jr., undoubtedly ranks among the outstanding horological student geniuses of the present day. He is 26 years old, received a six-month on-the-job apprenticeship training under Rollie C. Titus, jeweler-watchmaker of Dover-Foxcraft, Maine.



16-S, 17-J, designed and built by W. B. Davis, post-graduate student, Beehler School of Watchmaking, Chebeague Island, Maine.

At the completion of his apprenticeship, Mr. Davis enrolled for the one-year advanced finishing course conducted by The Beehler School of Watchmaking, under the directorship of Howard L. Beehler, Chebeague Island, Maine, where his unusual mechanical ability enabled him to complete this course in 3 months. He then enrolled for the second year master watchmaker course and made his masterpiece, shown above, in the remarkable period of 6 months. Mr. Davis is now employed by the Daniels Jewelry Store, Rockland, Maine.

Mr. Beehler informs us that W. B. Davis, Jr., made the thirty-two drawings showing all the basic lay-out problems necessary for the masterpiece. He also turned the pillar plate to dimensions from "raw" stock; located the "center distances" with a depthing tool, and recessed the lower plates for the barrel, center, 3-4-Escape, Pallet,

and Balance; laid out locations for screws, and steady pins.

Mr. Davis also made the following parts from "raw" materials: Barrel, Center, Train, Pallet, Balance Bridges; main spring barrel, arbor and stem, also all bridge screws, counter sinks, balance staff, and set all jewels. The complete "lay-out" drawings of Mr. Davis' masterpiece will be taken up in detail in an early issue of *The H. I. A. JOURNAL*.

Gruen Watchmaking Institute Student Has Unusual Hobby

Among the trainees of the Gruen Watchmaking Institute is Emmett P. Schepers. While he is taking his training here in Cincinnati, Mrs. Schepers is looking after their six children in St. Cloud, Minnesota, but she still manages to have time for social functions and Dresden China painting and league bowling.

Emmett tells us that his hobby is beekeeping and gave us a description of a colony of bees and their nature that we think will be of interest to the readers.

A colony of bees has one Queen. She is the only perfect female and is the sole mother of the colony. In the busy honey-gathering season she lays from 1,000 to 2,000 eggs a day and it is said the eggs equal her own weight.

Then there are the workers. These are the imperfect females and are what their name implies. They are also the protectors of the colony; in other words, they are the only members that sting.

Last we come to the gentlemen of the hive, the drone. He is larger than the worker, and his sole purpose is to mate the Queen and he loses his life in the act. Once the Queen is mated she remains fertile the rest of her life. The drone cannot eat by himself, but is fed by the workers. In the fall when the honey-flow is over, his usefulness is gone; so his sisters quit feeding him and in a few days he begins to weaken and then his sisters drag him out of the hive to die.

As Emmett says, his beekeeping hobby and horology will make a dandy combination, as it will afford recreation out in the sunshine studying nature at work.

The March Cover Story

The "Conical" pendulum shown on the cover this month is the invention of Christian Huygens, a Dutch mathematician, who is credited with the introduction of "swinging pendulum" principle to clocks, discovered by Galileo, in 1581.

It is generally accepted that "Huygens" conical pendulum was the first attempt to use centrifugal force for the continuous type clock escapements. The faster the motion, the farther the "bob" or ball swings outward, the speed of the motive power is retarded.

The principle was later adopted in the form of a "governor" for the speed control of stationary steam engines.

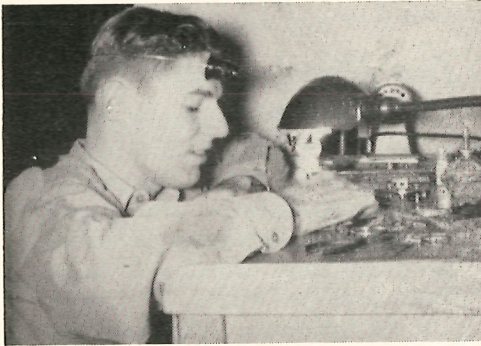
Bestfit
means best
quality in
STAFFS

1/2 DOZEN #
"THE BESTFIT"
Genuine
JBC2
STAFF
REFILLS

CORRECTION

On page 39, February issue, *H. I. A. JOURNAL* "EXAMINERS' GRADING SHEET", under PERFORMANCE, the first item should have read: P. U. (Pendant Up) NOT P. D. (Pendant Down).

Polio Victim Studies In Chicago School



FRANK WAGNER, JR.

Watchmaking, as an excellent occupational therapy for the semi-disabled and the part played by the Chicago School of Watchmaking in assisting an exceptional paralysis victim, was brought to public attention recently in the case of Frank Wagner, Jr., 19-year-old polio victim of Niles, Ill., former high school football player, who has completed a half-year's course in watchmaking, although confined to a wheel chair in his home.

The Sweazy brothers, Byron, Thomas and John, operators of the Chicago School of Watchmaking, heard of his plight and worked out a schedule for the youth. They constructed a special bench which enables Wagner to work from his wheel-chair. A ramp was designed which raised the chair for close work at the bench. The brothers have been visiting Wagner several times weekly for several months. This type of instruction is made possible because of Sweazey's copyrighted system of instruction. Tools, materials, supplies and practice movements are delivered to him for every phase of the course.

Young Wagner has two projects in mind: the first is to assist the Sweazey's in outlining a course based on his experience for other disabled persons confined to their

homes; the other to open a shop of his own. He may change his mind on the second item, however, for he has already been offered a job as a watchmaker by James Hall, also a polio victim who has been in business for many years, and who was also graduated from the Chicago School of Watchmaking in 1923.

The Chicago School of Watchmaking has several disabled students attending regular classes.

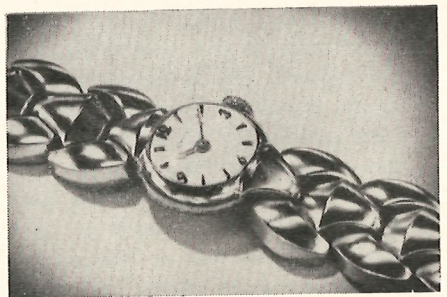
Iowa Watchmaker's Licensing Law Repealer Defeated

The effectiveness of organized cooperation was clearly demonstrated in the defeat of an amendment introduced by Rep. Arthur Jacobson, Waukon, seeking to repeal this Iowa Watchmakers Licensing Law.

Rep. R. R. Batman of Eldora, vigorously defended the present Watchmakers' Licensing law as a protection to the public against damage to valuable property by inefficient and unskilled watch "tinkers".

It is evident in states having Watchmakers Licensing laws, that this type of legislation is meeting the approval of the public, jewelers and competent watchmakers because in other states similar attempts to repeal this law have been defeated.

NEW WATCH CREATION



Following the latest style trend set at the Geneva Watch Exposition held last Fall, this Swiss watch creation has a round, easily read open face set in a 14K gold case. The link bracelet was especially designed for the case enclosing the 17-jewel movement.

Swiss Parts Package to Be Distributed

The new Official Swiss Parts Package will be distributed to watch parts suppliers beginning next month, Paul Tschudin, director of the Swiss Watch Repair Parts Information Bureau, has announced.

The new package will contain factory-tested, perfect parts securely wrapped in heavy foil as protection against damage. Carefully sealed against moisture and corrosion, the package will be completely labeled for quick, easy identification.

As soon as national distribution of the packages is completed, the suppliers will begin to fill the watchmaker's orders with the packaged parts. Suppliers' stocks of staffs and stems for the most widely used Ebauches movements as shown in Part 1 of the new Official Catalogue of Swiss Watch Repair Parts will be the first to be replenished with the new Official Swiss Parts Packages.

Watchmakers are advised to use the Official Catalogue of Swiss Watch Repair Parts in ordering all parts. Even though parts being ordered may not be packaged as yet, suppliers already are employing the identification and ordering system set by the Catalogue, and the use of this system will make the task of both ordering and filling orders much easier.

HARD-TO-GET

If you are having difficulty obtaining a Swiss or American watch part, try

J. A. POLTOCK & CO.

15 Maiden Lane - New York 7, N. Y.

Write for free catalogue ● ligne gauge
● stationery

Dept. H

PERSONNEL PETERS SCHOOL OF HOROLOGY, WASHINGTON, D. C.



When Mr. Forrest E. Peters, Technical Director of the Peters School of Horology, Washington, D. C., saw his instructors lined up for this picture at the recent Fourth Annual Banquet of the Staff and Faculty, his only comment was, "So that's where all the money goes! I didn't know I had so many people working for me!"

From left to right, the instructors and their subjects are, C. Zeller, Night School, Staffing, H. Pearl, Day Tool Man, W. Everhart, Night School, Nomenclature and Function, H. Halstead, Lathe Rooms, T. Myrick, Night School, Filing, Sawing and Lathe Work, J. Keski, Balance Truing and Dial Work, J. Schwartz, Jeweling and Record, H. Luzier, Night School, Lathe Rooms, M. Mudron, Nomenclature and Function, Assembly and Disassembly and Cleaning, J. D. Brown, Dean of School, Supervisor over all instructors, W. Peters, Supervisor of Lathe Rooms, M. Whitney, Night School, Supervisor of Night School Instructors, Escapements, Poising, Truing, and Jeweling, M. Shaw, Balance Staffing and Mainsprings, C. Smith, Supervising Principal of Engraving, P. O'Gulian, Assistant to Dean and Escapements, J. Ross, Night School, Assistant Engraving Supervising Principal, R. Pace, Night School, Cleaning and Oiling, C. Washington, Balance Poising, Hairspring Work and Oiling, and E. Henson, Night School, Cleaning and Oiling, and Assistant to R. Pace.

Not pictured are K. Young, Night School, Hairspring Work, and R. Denniston, Night School Tool Man.

Forgotten Men of World War II Remembered by Leeds

Those who served in the Merchant Marine during the war are the forgotten men of World War II. So feels Paul Leeds, once director of Veterans Administration Rehabilitation Information in Chicago, who single handedly has set out to do something about recognizing the invaluable services to the country performed by these men during the war. Men who served in the Merchant Marine are not eligible for schooling under the GI Bill of Rights and Public Law 16.

Leeds, now head of the Chicago Institute of Watchmaking, 7 S. Pulaski Road, gave the first recognition to the Merchant Marines for their war services, educationally speaking, when his school offered scholar-

ships to the men. The first scholarship is valued at \$1150.00. More important, however, the entire watchmaking industry is watching progress with a view to expanding these scholarships for the Merchant Marine.

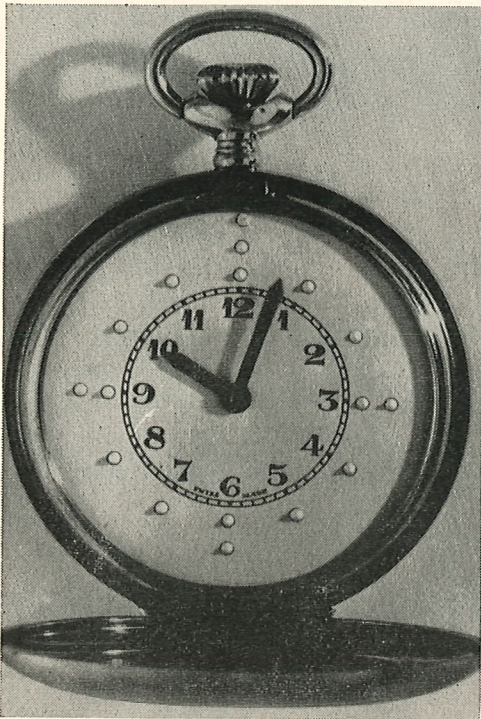
The men themselves who are flocking in to apply for the scholarships are even more enthusiastic about the fact that for the first time, someone has gone out of his way to recognize the value of their war records. Praise for Leeds' single-handed attempts to help the ex-Merchant Marines in a tangible form comparable to the help available to ex-GI's is coming in from every side. Leeds points out that many of the men who served in the Merchant Marine were rejected for physical reasons by the other services and still went into the Merchant Marines voluntarily so that they might help this country win the war.



Paul Leeds, (center), director of the Chicago Institute of Watchmaking, shows some of the School's watchmaking and instruction equipment to the four finalists in the Chicago Institute of Watchmaking Merchant Marine Scholarship Award. One of these men will receive a scholarship at the school, which together with the equipment, is valued at \$1,150.00; announcement of the winner of the award will be made April 1. L. to R., Alexander Boroušk, Felix P. Natonek, Stanley Repel, and Joseph Holich.

Watches for the Blind Made By Swiss

NEW YORK—Braille watch production in Switzerland is increasing with 40,000 now manufactured annually in Swiss factories to meet the demand. After the first World War these manufacturers accepted the added responsibility of making the braille watches, which are distributed principally through the Red Cross and special organizations for the blind.



Straight-on view of the Braille pocket watch manufactured by the Swiss. The dial, made of white enamel, is washable. The metal cover protecting the face is snapped open by pushing the winding stem.

The movement of the pocket watch is identical to movements used in standard watches. Outside of each number on the watch dial is a raised impression, similar to those used in braille publications, that can be felt with the fingers. The number 12 has three raised impressions, and numbers nine, six and three have two. Thus a blind person can quickly orientate himself on the watch.

The dial is made of white enamel which is washable. The watch does not have a crystal and the user can feel the dial directly. To protect the faces of the pocket watch a metal cover closes over it, and is snapped open by pushing the winding stem. The hands are made of a special steel which is strong and can be bent back into position should they be pushed improperly.

KANSAS CONVENTION PLANS COMPLETED

The Kansas Retail Jewelers and Watchmakers Associations have completed plans for the 1949 W. B. "Bill" Brasfield, Memorial Convention and Gift Show, which will be held April 2-3-4 in Hotels Lassen and Allis, Wichita.

The convention committees have been hard at work on a program which promises to surpass any previous convention in interest and attendance.

The hotels are cooperating 100% in providing display space and have assured the committee that all sample rooms will be reserved and available for exhibitors.

Reservation for rooms should be made direct to the hotels.

The official program is expected to go to press about the 15th of March, and advertisers are requested to send in their copy as early as possible.

Bestfit

means best
quality in
HANDS

MINUTE / #
¼ DOZEN
"THE BESTFIT"
Genuine
6 C INDEX
HAND
REFILLS



TAKE MY ADVICE "DON'T

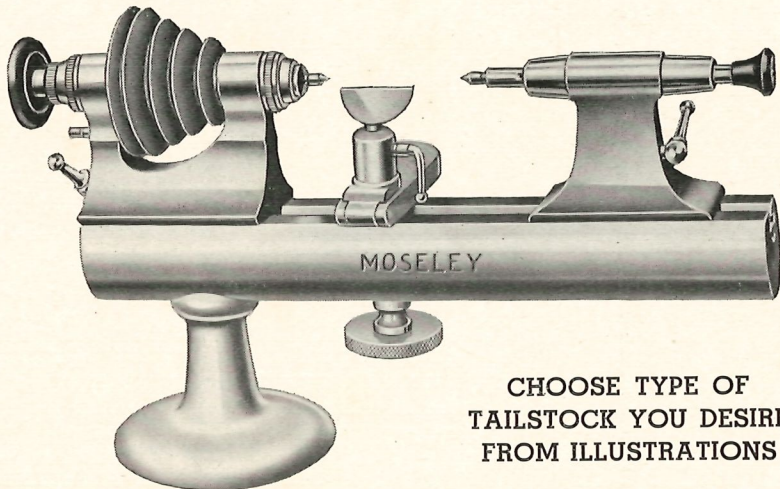
As a Watchmaker who learned the hard way about the variations in the quality of tools that I use, I'd like to pass along some helpful advice. **DON'T BUY AN UNPROVED PRODUCT.**

Take lathes for example, many of them have been manufactured without any thought to long life and dependable service. Many of these lathes will not even be on the market, 2, 3, 4 or 5 years from now. If you buy one, you may not be able to get maintenance service.

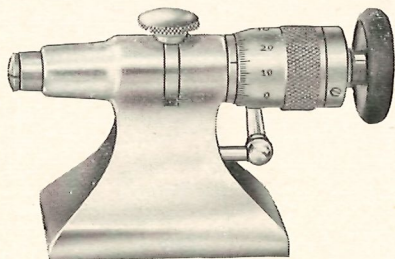
\$114.00

AND UP

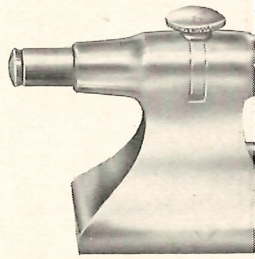
ALL LATHES
COMPLETE
WITH
TAILSTOCKS



CHOOSE TYPE OF
TAILSTOCK YOU DESIRE
FROM ILLUSTRATIONS



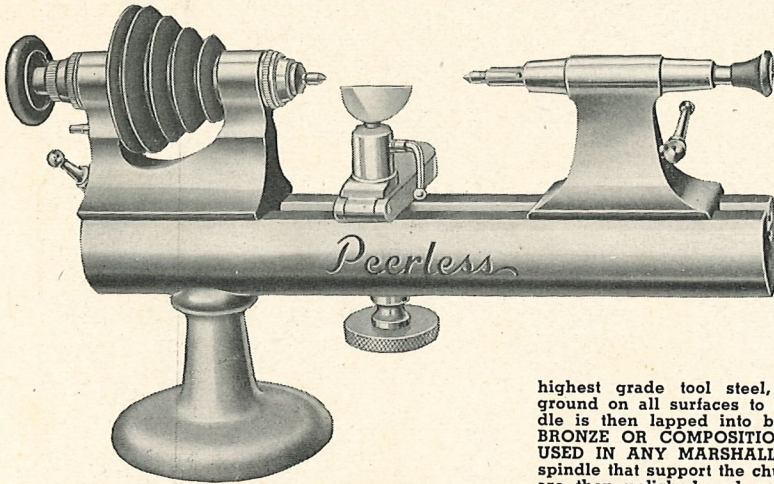
TAILSTOCK,
CHUCK HOLDING
SPINDLE AND
MICROMETER STOP



C. & E. MA

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For many years Peerless and Moseley lathes have been proved precision tools. During World War II C. & E. MARSHALL COMPANY manufactured about 95% of the lathes used by the U. S. Government. Every lathe was inspected by an industrial technician, working for the government, as it came off the production line. **NOT ONE LATHE WAS REJECTED.** Today, tomorrow, and every day, C. & E. MARSHALL is manufacturing precision lathes for you.

I'd like to pass along some mighty important information about the features of the Peerless and Moseley lathes . . . features that I have found are combined to assure a precision tool with long life and dependable service.

You are assured of a precision tool containing only the finest of materials. The lathe bed is made of the finest close grained iron obtainable. Distortion and strain are prevented because the metal is thoroughly seasoned. Perfect alignment of headstock and tailstock is assured as the bed is machined to shape and ground to a micro finish. The bed is amply protected for a long life of dependable service because it is polished and then given three coats of plating—copper, nickel, and then chromium.

There is no possibility of side or end shake in the main or live spindles because they are made of the

highest grade tool steel, machined and hardened, ground on all surfaces to a zero tolerance. The spindle is then lapped into bearings to a mirror finish. **BRONZE OR COMPOSITION BEARINGS ARE NEVER USED IN ANY MARSHALL LATHE.** Inside angles of spindle that support the chuck and the draw-in spindle are then polished and ground while the spindle is running in the headstock in its own bearings.

Vibration in the cone pulley is eliminated as it is perfectly balanced . . . made of Bakelite on heavy flanged metal hub. Ample opportunity for indexing as flanged end of hub is drilled with sixty holes.

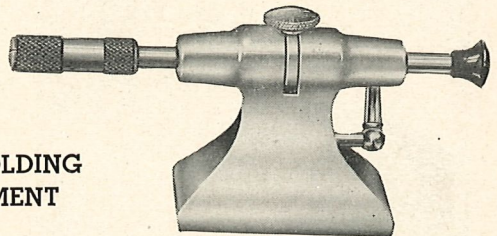
Velvet smooth tailstock operation is assured because the spindle is made of high grade tool steel, hardened and ground, fitted after tailstock bearings are honed. The spindle actually floats because of the protective coating of oil. Headstock and tailstock are made of finest close grained iron and given three coats of plating, like the lathe bed.

All Marshall lathes are available with the types of tailstocks shown below. (1) With Tailstock, chuck holding spindle and Micrometer stop. (2) With tailstock chuck holding spindle. (3) With chuck holding attachment. (4) With plain spindle. With special tailstocks you can do jobs that you cannot do on most lathes. With the Micrometer stop you can gauge your work to 1/100 MM accuracy.

After reading the above, you'll see why I am so well satisfied with the performance of my Marshall lathe. Before you buy, take my advice and don't buy an unproved product. Buy a Peerless or a Moseley Lathe with that built-in quality that will give you a lifetime of dependable service.



TAILSTOCK CHUCK
HOLDING SPINDLE



CHUCK HOLDING
ATTACHMENT

MARSHALL CO.

, and Principal Cities

MEMBERS OF THE JOINT TENNESSEE WATCHMAKERS- JEWELERS CONVENTION COMMITTEE

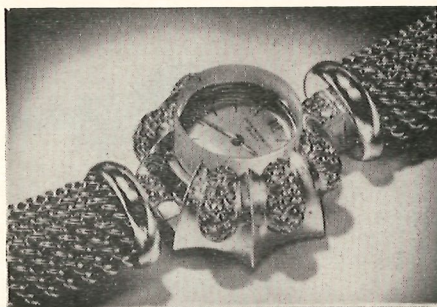


JOINT CONVENTION COMMITTEE—Seated, left to right: H. J. Webb, S. George Cochran, Gus Griffin, Ralph Langueck, William Kazian, Sam Cordell, William Newton. Standing, left to right: John Koehn, Willie Allen, Howard Stone, L. D. Stallcup, Ed. Cochran, William Hellis, C. A. Stowe, Curtis Hughes, Charles Britton, C. T. Denton, W. T. Russell, J. A. Cassinino. Mr. Robert F. DuBose, Convention Chairman, made the picture.

BRITANNIA METAL: First made in England in 1770 and may be considered as the successor to pewter. Tin is the principal constituent. To this is added a small amount of antimony and copper. Britannia metal is much harder than pewter.

CRESCENT: A semi-circular notch in edge of roller table of a watch movement to permit the guard pin or point to pass the line of centers during unlocking and impulse — sometimes called **PASSING-HOLLOW**.

NEW WATCH CREATION



The high raised crystal is practically a fashion "must", according to Swiss watch designers. Pictured is one of the latest styles to come from Geneva drawing boards. The case of gold is set with innumerable diamonds and the strap is made of velvet.



TESTIFYING FOR WATCH ASSEMBLERS—James W. Bevans (left), counsel for the American Watch Assemblers' Association, and Abraham Carnow, president of the association, appear before the House Ways and Means Committee February 1 to urge extension of the present reciprocal trade agreements without restrictions.



NEW TENNESSEE GUILD HAS BEEN ORGANIZED

An application for a charter authorizing the organization of Guild No. 7, to be known as the Columbia Guild, has been filed with the Tennessee Watchmakers and Jewelers Association. Temporary officers have been named, following a meeting held February 3 in the Chamber of Commerce Building in Columbia, Tenn.

Twenty-three watchmakers and jewelers from Columbia, Mount Pleasant, Hohenwald, Fayetteville, Pulaski, Waynesboro, and Lawrenceburg attended the organization meeting and signed the application for a charter.

H. E. Withworth of Mount Pleasant, Tenn., was named temporary chairman. E. H. Glenn of Columbia, Tenn., was named as secretary pro tem.

Organization plans were directed by Guild No. 1. A delegation of that guild, consisting of Sam Cordell, president; John Varollo, director; Lyle Taylor, director, Edward Cochran, secretary; H. W. Stone, state director; L. D. Stallcup, William Kazian, Gus Griffin and Charles Bitton, attended the meeting.

Charter members of the new guild will include: R. D. Williams, Tom Whitworth, John King, Fred D. Osborne, Alton Smith, George Worsham, C. W. Helm, Kannon Johnson, Robert G. Kline, J. E. Hedges, J. R. Culp, D. E. Grissom, Euclid C. Williams, John T. Gotham, E. H. Glenn, H. E. Witworth, A. M. Harris, Jr., R. C. May, L. M. Grossman, John W. Petty, T. D. Tidwell, Jones C. Defoe and Ralph Soulder.



Andrew Jackson Hotel, Nashville, Tenn., where Joint Jewelers-Watchmakers Convention will be held.

The Ladies' Auxiliary of Nashville Guild No. 1, Tennessee Watchmakers and Jewelers Association, held a dinner meeting in the Andrew Jackson Hotel in Nashville, Feb. 8, to complete plans for the Joint Tennessee Jewelers and Watchmakers Convention. Mrs. Hugh Webb was elected chairman and Mrs. Robert DuBose, secretary.

The Watchmakers and Jewelers of Putnam and adjoining counties met in Cookeville, Feb. 18 to form Guild No. 8 of the Tennessee Watchmakers and Jewelers Association. Mr. Jack Boden and Mr. Murray Ball of Cookeville were active in organizing the Guild.

Among the country's famous horologists and educators who will attend the joint convention May 1-2-3 is William H. Samelius. Uncle "Billy" is a life member of the Tennessee Watchmakers & Jewelers Association.



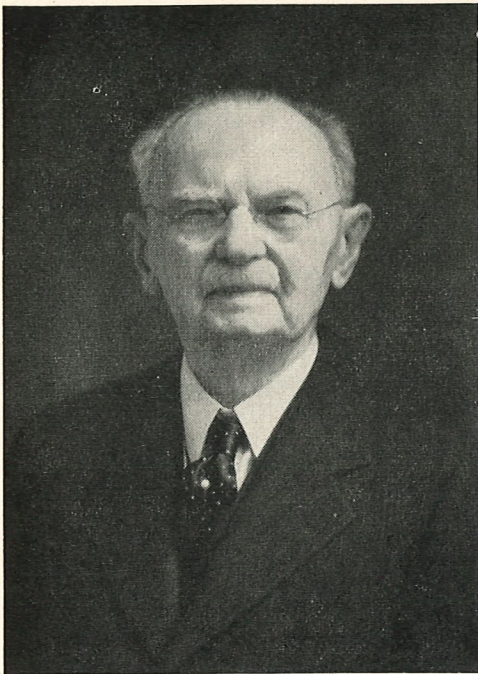
LADIES' AUXILIARY, JOINT CONVENTION COMMITTEE

Seated, left to right: Mary Elizabeth Denton, Vera Burlason, Mrs. Ralph Languack, Mrs. Gus Griffin, Mrs. H. J. Webb, President; Mrs. Robert DuBose, Secretary. Standing, left to right: Mrs. S. George Cochron, Mrs. L. D. Stallcup, Mrs. William Kazian, Mrs. John Koehn, Mrs. Willie Allen, Mrs. J. A. Cassinino, Mrs. W. T. Russell, Mrs. William Newton, Mrs. Howard Stone, vice-president; Mrs Sam Cordell, treasurer.



Watchmaking class room of the Jewelry Training Service, 226 S. Wabash Ave., Chicago, an H. I. A. Certified School.

"The Half-Century Club"



RUDOLPH H. BAUDE

Welcome, Rudolph H. Baude of Louisville, Ky., to the H. I. A. JOURNAL HALF-CENTURY CLUB membership.

Mr. Baude, a native of Zduny, Province of Posen, Prussia, was born Nov. 7, 1856. In 1871, when he was 14½ years old, he left Hamburg, Germany, and came to

America to live with an uncle, C. F. Drabnick, a watchmaker in Jeffersonville, Ind., under whom he served his apprenticeship. His first employer was Math Irion.

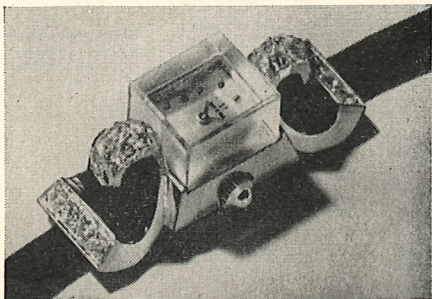
He returned to Germany in 1878 to visit his parents and enrolled in the Horological School at Glashute, Saxony, to study. He returned to Louisville, Ky., in the fall of 1878 and was made a partner of Mr. Irion in January, 1879.

Mr. Baude competed in an international essay contest in 1880 and won third prize, awarded by The Jourualder Uhrmacher Kunst of Leipzig, Saxony.

In 1883, Mr. Baude opened his first store in Louisville. The following year he made a street clock, which has been running since 1884. His son, a graduate of the Peoria Horological School, joined him in the business, but was killed in France in World War I. A. J. Hackman of Louisville, who joined Mr. Baude in 1907, and who had an interest in the store for 25 years, purchased the business in 1947.

Mr. Baude has trained many fine watchmakers in America. He has been an active watchmaker for 75 years, and for 62 years was in the same location, 306 West Market St., Louisville, Ky. He retired from business two years ago. He is a life member of the H. I. A.

NEW WATCH CREATION



Diamonds and rubies in a gold case, provide a striking setting for this new-style raised crystal watch. The 17-jewel movement and case were made by one of the oldest Geneva, Switzerland, watch factories.

½ DOZEN # _____

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Genuine
**SECOND
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= 175 Assortments

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**SECOND
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FOR YOUR PROTECTION
• ASK YOUR JOBBER •

ALABAMA WATCHMAKERS PLAN TRI-STATE MEETING

A tri-state convention has been planned by the Alabama Watchmakers Association, which will bring together watchmakers of Alabama, southeastern Mississippi and northwestern Florida, on May 15 and 16. The convention will be held in the Admiral Semmes Hotel in Mobile, Ala., with the Mobile Guild as hosts to the watchmakers of the three states.

The convention committee has arranged an interesting and entertaining two-day gathering, which promises to be the most successful from the standpoint of attendance and interest, ever held in the state.

Several outstanding horological authorities have been secured as speakers for the convention. Topics of vital concern to all watchmakers will be discussed. Announcement will be made later of the list of speakers and details of the convention program.

Featured on the convention program will be displays of some of the latest watch-

makers' tools and accessories, an exhibit which will be open to the general public.

The recently elected officers of the Mobile Guild, who are directing plans for the entertainment and program arrangements, are:

Robert E. Nelson, president; Fritz Kraft, vice-president; Peter Sienke, secretary-treasurer; Bruce Vielle, Joseph Sperna and Henry Hudson, directors.

Several hundred watchmakers from Alabama, Mississippi and Florida are expected to attend the two-day convention.

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BEST QUALITY
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Genuine
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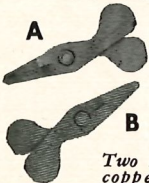
CROWN

Assortment # _____

**ASK
YOUR
JOBBER**

SETSIT*

*sets jewels
accurately -- quickly*

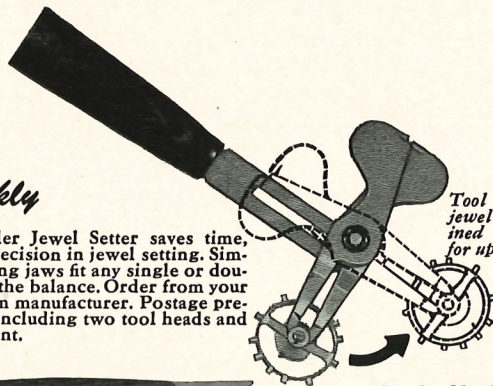


*U. S. PAT.
OFF.

Two interchangeable
copper tool heads.
Tool "A" for smallest
balances. Tool "B"
for 16, 18 and larger
balances.



Metal prongs on Cocobolo handle
hold tool head firmly in place.



Tool head rotates so
jewel may be exam-
ined in all positions
for uprighing.

P. A. HARMON
Certified Master Watchmaker, H. I. A.
1821 E. Illinois St.
Evansville, Ind.

LEON CLARK PASSES AWAY



Leon Clark, 80 years old, veteran

watchmaker and well known railroad time serviceman, has passed away. Mr. Clark had been associated for 44 years with the Ball Railroad Time Service, and previously had been a successful watchmaker, jeweler and registered optometrist in DeKalb Junction, N. Y.

He was a member of the Horological Institute of America; a graduate of the Geneva School of Refraction; a life member of the Independent Order of Odd Fellows. He is survived by three daughters, three stepsons, three grandchildren and two great-grandchildren.

In a eulogy paid him by H. S. Schrantz of Cleveland, Mr. Schrantz stated: "Practically his whole life was dedicated to the science of horology and he was an inspiration to his associates. His activities in the H.I.A. were second only to his work in railroad time service, and during one period he had accepted more applications for new members than any other active member of the Institute. He was a fine watchmaker and at his death had a room completely equipped with all necessary tools and instruments used in watch and clock repairing."

Head of National Jewelry Group Dies

Frederic S. Reid, of Springfield, Ill., 36 years old, president of the Watch Material Distributors Association of America, died February 19 following an operation.

He was a member of the firm of Burton M. Reid Sons, Inc., Springfield, wholesale distributors of jewelry supplies.

Reid was graduated from Springfield High School and from Williams College, in Williamstown, Mass., with an A.B. degree in 1933. During his high school and college days he was an active football player.

Surviving in addition to his wife and brother are a daughter, Carol, and a son, Chase.

Indiana Jeweler Dies

Charles Morgal, Brazil, Ind., age 74, jeweler, died at the Clay County General Hospital, Feb. 10. He had been actively connected with the retail jewelry business in Brazil for nearly half a century. Prior to entering the retail jewelry business, he represented a Cincinnati (Ohio) wholesale jewelry concern. Mr. Morgal was active in civic affairs of his home town, and was a charter member of the Brazil Elks Lodge.

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.*

QUESTION: Having been urged to buy a brand of watch oil claimed to be the best yet, I would like to have some method for testing it quickly, before changing from the oil I have used until now.

ANSWER: We regret that there is no method we can give you for making a reliable test of watch oil in a short period of time. No matter what tests are given an oil, even in a well-equipped laboratory, the final check-up must be made by using the oil in a number of watches of actual use under various conditions. Oil may be affected differently in watches carried by persons in various employments, in different climates, etc.; and the best oil is one that will average best in use under the widest range of conditions. Such tests inevitably require a long time for reliable proof of qualities of an oil.

QUESTION: When we find a screw in a watch with the head broken off, and the threaded part stuck tight in the plate, how can the broken stump be most quickly removed?

ANSWER: First try to remove the stump of the screw mechanically. If it is not wedged tightly in its hole, it may be worked out by pressing a slim graver point into the steel near the edge of the broken surface, and carefully exerting a turning motion on the screw through the graver. If this does not move it, apply a screw-extracting tool, obtainable from your supply house. This is a U-shaped piece of metal with opposite adjustable blades in its open end, to grip the broken stump at each end; then turning the tool will unscrew the stump. This cannot be used unless both ends of the stump can be reached. If none of these mechanical

Bowman Technical School

Lancaster, Pennsylvania



John J. Bowman, *Director*

Sixty-two years' experience
in training successful Watchmakers, Engravers, Jewelers.

Graduates pass Certified Master Watchmaker tests, H. I. of A. or any state Board examination.

Write for catalog.

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

means will do the trick, you will have to use a chemical bath that will dissolve the steel screw without attacking the other metal in which it is imbedded. This can be done with alum dissolved in water, kept hot, with the work immersed in it. There is a solution on the market that is made on a secret formula and that works much more quickly than alum solution. This Baron Screw Removal Solution by Meiskey's, Inc., Lancaster, Pa., and obtainable directly there or through other material supply houses.

QUESTION: Can you say what might stop an old clock I overhauled, which runs fine on brackets in my shop but may stop once a month or so in the owner's home? It has wooden upright bars that hold the trains. I bushed all holes with brass and can't see anything wrong with escapement or anything else.

ANSWER: If your opinion that there is nothing wrong with the escapement, etc., is correct, then we suggest looking for trouble in the train. You say you bushed all the pivot holes. Let us say that in the kind of clock described, with wood bars held in a wooden frame for the train bearings, the bushings should not fit pivots closely; there ought to be more side shake of pivots than in a clock with one-piece plates. The reason for this is that in a wood-bar movement, the frame is not rigid; changes of weather, and other changes of conditions, like moving the clock from the brackets in your shop to the supports in the clock case in the owner's home, may cause the positions of the wood bars to change slightly; this could cramp pivots in their holes and stop the clock. If there is not a pretty free play of the pivots in the bushed holes. And the effect would be just as you describe—an occasional stoppage, with long intervals of running, perhaps. A good way to open the bushed holes would be to run a taper-broach in half way from each side, which would make a hole somewhat like an olive-hole in a watch jewel, and be an extra precaution against cramping pivots.

Dear "Professor":

I wish to know if you can give me any information on how a Rosary bead is made? By this, I mean the complete assembly of a strand.

The reason I say this is—I have a young fellow who cannot use his legs or get around well at all. Quite often I have him string beads for me and he is doing quite well now with engraving I have taught him. However, this is not near enough in our community, and for that reason my thoughts fell on making Rosary beads for resale. I know they are for sale at a few dollars up and for that reason I wish to know if there is very much hand work on them, or is there some kind of a machine that assembles and bends the wire.

The beads, I guess, can be bought in New York. It is the wire and all other material I wish to know about. I have never talked to anyone who knows very much about it or where I may find this information. If you can give me any information on this or advise me how to obtain it will you kindly do so.

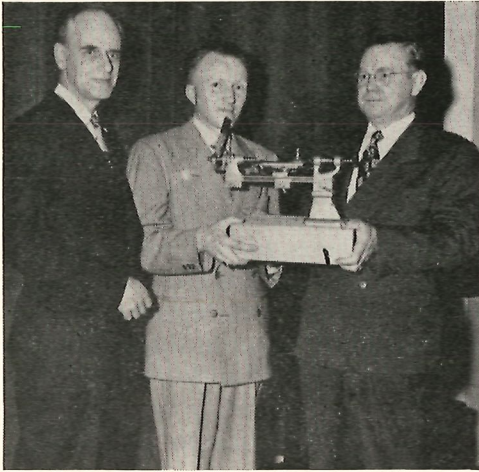
J. W. S., Sunbury, Pa.

Answer:

Your letter asks about manufacturing Rosaries, presumably as handcraft work instead of by machinery in mass production. First, we should point out that the H. I. A. JOURNAL devotes its various services to work in the horological field; not to jewelry work. However, while writing you, we will suggest that you inquire of Ajax Findings Co., 387 Charles St., Providence 4, Rhode Island, about what they could supply in chains, clasps, etc., which, with the beads you say you can buy, could probably be assembled into rosaries. Or the firm named may be able to refer you to other suppliers of whatever you may need for what you have in mind in this matter.

"PROFESSOR."

Swiss Precision Lathe Awarded to Repair Contest Winner



Thelbourne Cooper (center), watch repair department manager of East Side Jewelers, Los Angeles, receives a Swiss lathe donated by The Watchmakers of Switzerland for his winning entry in the recent national watch repair contest. The award, held at the (January 19) meeting of the Los Angeles Guild of Horological Association of California, was made by O. D. Johnson (right), retiring local chairman of the Guild, and Rodney C. Schenk, new State Association President.

Cooper competed with watchmakers and jewelry store managers who were asked how their work had increased the overall sales of their jewelry store. Prizes were given by The Watchmakers of Switzerland as part of their Swiss Watch Repair Parts Program to help jewelers build higher profits from repair departments.

ILLINOIS BUNN SPECIAL

21-J., 16-S., 60-Hr. and Elinvar Like New, \$35;
Waltham 21-J., 16-S., Adjusted, \$22;
Adjusted to 5 positions, \$27.

WRITE FOR PRICE LIST ON
RAILROAD WATCHES

Bargains in Wrist Watches

MORRIS FREY WATCH CO.
915-16 Holland Bldg., St. Louis 1, Mo.

SWISS WATCHMAKERS OFFER STUDENT AID TO H.I.A.

The Watchmakers of Switzerland has announced plans for offering horological students a suggested curriculum for classroom presentation.

In an announcement to the editor of The H.I.A. JOURNAL, Paul Tschudin, director of the Swiss Watch Repairs Parts Information Bureau in New York, stated that the Watchmakers of Switzerland "will soon make available" the curriculum, presenting the program of the bureau as a classroom aid.

According to Mr. Tschudin's statement, it will be the purpose of the Bureau to have the material available within the next two months for schools of horology, covering features outlined in the Official Catalog of Watch Parts, the Official Dictionary of Watch Parts, the Official Parts Package and the Official Cabinet, enabling students to be familiar with it after graduation.

The Official Catalog, which introduces the standard system of parts identification of movements bearing bauches S. A. symbols, will be followed by Part II, which will cover virtually all remaining Swiss movements, Mr. Tschudin also stated.

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Ladies' Wrist Watches Our Specialty

PROMPT SERVICE

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WORK GUARANTEED

HERB SIMS

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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.

The Motion of the Balance Wheel

By HOWARD L. BEEHLER.



Howard L. Beehler

The balance wheel of a watch is either riveted or fitted friction tight to the balance staff. The roller table that supports the jewel pin is fitted friction tight to the balance staff also. The balance staff and wheel are supported in the plates and bridges by pivots that turn in jewels. See sketch of balance assembly.

The motion of the balance wheel refers to the angular displacement of the jewel

pin, in both directions, from its neutral position on the line of centers of the escape wheel, pallet arbor and balance staff. It is the function of the hairspring to return the jewel pin to its neutral position.

The angular displacement or amount of motion of the balance wheel depends in most part upon the amount of impulse given to the jewel pin by the pallet and fork.

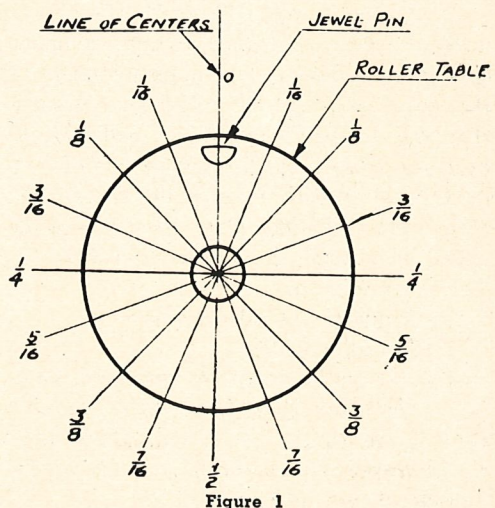


Fig. 1 shows the position of the jewel pin when the hairspring is unstressed. Let us assume that the mainspring is wound enough to permit an impulse of sufficient force to be given the jewel pin to move it $1/16$ of a turn away from the line of centers or neutral position. The energy that is now stored in the hairspring returns the pin to the line of centers or neutral position. This series of events begins all over again. Since the jewel pin turns $1/16$ of a turn on one side and $1/16$ of a turn on the other side of the line of centers, it can be seen that the total angular swing is $1/8$ of a turn. This amount of movement can be referred to in three ways:

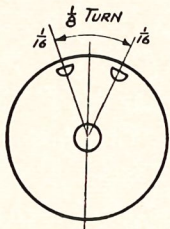


Fig. 2

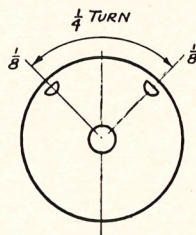


Fig. 3

1. A motion of $1/8$ turn.
2. An eighth of a turn motion.
3. A motion of 45° .

If additional energy is put into the mainspring by winding, the impulse given to the jewel pin will be increased. Assume that this increased impulse is sufficient to turn the jewel pin through an arc of $1/8$ of a turn on each side of the center line (Fig. 3). The complete motion can be stated in any of the following ways.

1. A motion of $1/4$ turn.
2. A quarter of a turn motion.
3. A motion of 90° .

Thus it can be seen that additional winding of the main spring increases the impulse force given to the jewel pin. This additional force may establish any one of the motions shown in Figs. 4 to 9.

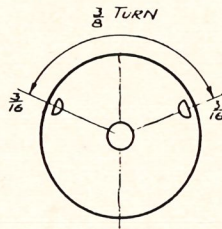


Fig. 4

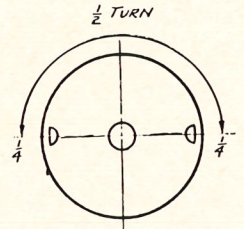


Fig. 5

Fig. 4 shows $3/8$ of a turn motion or a motion of 135° .

Fig. 5 shows $1/2$ of a turn motion or a motion of 180° .

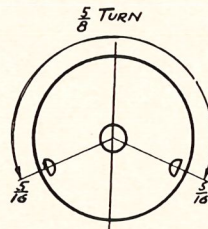


Fig. 6

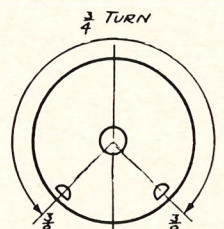


Fig. 7

Fig. 6 shows $5/8$ of a turn motion or a motion of 225° .

Fig. 7 shows $3/4$ of a turn motion or a motion of 270° .

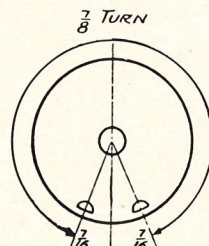


Fig. 8

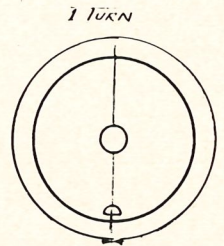


Fig. 9

Fig. 8 shows $7/8$ of a turn motion or a motion of 315° .

Fig. 9 shows a full motion of 1 turn or a motion of 360° .

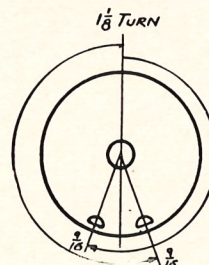


Fig. 10

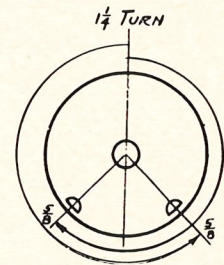


Fig. 11

FIG. 10 shows the balance wheel making $1\frac{1}{8}$ turns.

FIG. 11 shows the balance wheel making $1\frac{1}{4}$ turns.

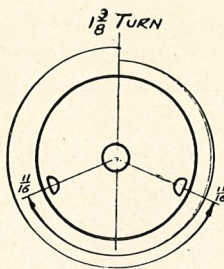


Fig. 12

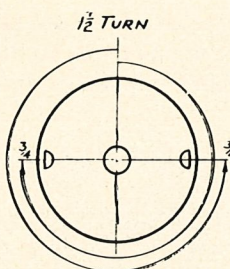


Fig. 13

FIG. 12 shows the balance wheel making $1\frac{3}{8}$ turns.

FIG. 13 shows the balance wheel making $1\frac{1}{2}$ turns.

It is impossible to determine the motion of a watch by observing the jewel pin. Because of its position it cannot be seen in the average watch. Therefore, we must resort to the balance arms to help us in judging the amount of motion.

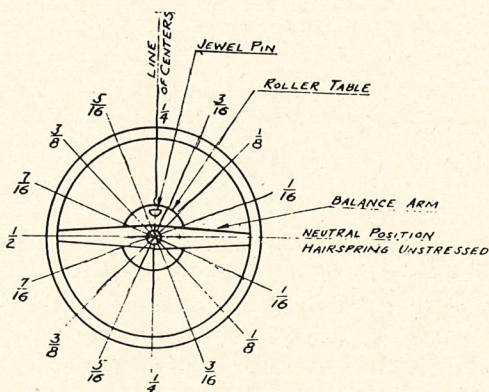


Figure 14

When the jewel pin is on the line of centers the balance arms are in the neutral position as shown in Fig. 14. This neutral position is used as the reference for determining motion.

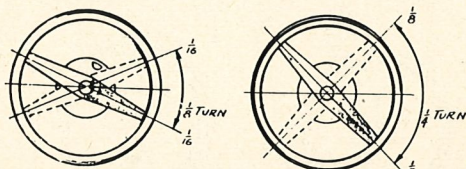


Fig. 15

Fig. 16

Suppose the mainspring is wound enough to permit an impulse to the jewel pin of sufficient force to move it $1/16$ of a turn away from the line of centers (Fig. 15). In doing this the balance arm moves $1/16$ of a turn away from the neutral position. The energy stored in the hairspring then acts to return the balance arm to the neutral position where the jewel pin receives a new impulse causing the arm to move $1/16$ of a turn on the opposite side of the neutral position. Since the balance arm moves $1/16$ of a turn on one side and $1/16$ of a turn on the other side of the neutral position it can be stated in any one of three ways that the amount of motion of the balance wheel is:

1. A motion of $1/8$ turn.
2. An eighth of a turn motion.
3. A motion of 45° .

Suppose that by winding the watch a little more the balance arm is caused to move $1/8$ of a turn away from the neutral position. After being returned to the neutral position by the hairspring a new impulse causes the arm to move $1/8$ of a turn away from the neutral position on the other side. Thus the total amount of motion of the balance arm can be stated to be:

1. A motion of $1/4$ turn.
2. A quarter of a turn motion.
3. A motion of 90° .

By winding the watch a little more each time the additional energy may establish the various motions shown in Figures 17 to 22.

Fig. 17 shows $3/8$ of a turn motion or a motion of 135° .

Fig. 18 shows $1/2$ of a turn motion or a motion of 180° .

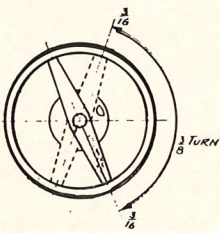


Fig. 17

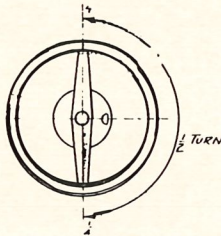


Fig. 18

Fig. 19 shows $5/8$ of a turn motion or a motion of 225° .

Fig. 20 shows $3/4$ of a turn motion or a motion of 270° .

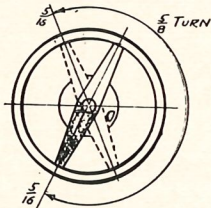


Fig. 19

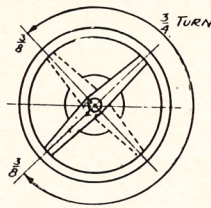


Fig. 20

Fig. 21 shows $7/8$ of a turn motion or a motion of 315° .

Fig. 22 shows a motion of 1 turn or a motion of 360° .

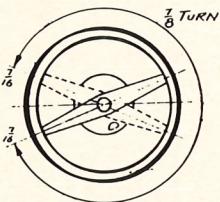


Fig. 21

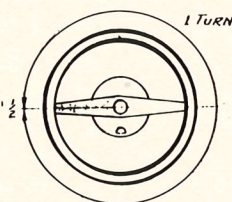


Fig. 22

So far we have been studying motions up to a full turn. More often we find motions greater than one turn and so it is important that we are able to read them. Fig. 23 shows that the balance arm has moved $9/16$

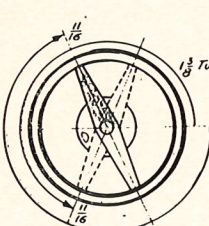


Fig. 23

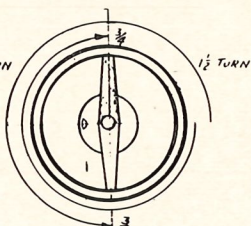


Fig. 24

of a turn from the neutral position in one direction and after the next impulse $9/16$ of a turn in the other direction from the neutral position. This constitutes a motion of $1 \frac{1}{8}$ turn or 405° . Notice that the balance arms crossed each other at the 180° point and moved $1/16$ of a turn beyond the point of passing. It is important that the

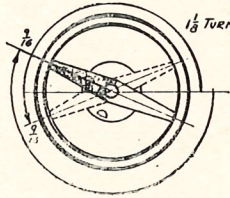


Fig. 25

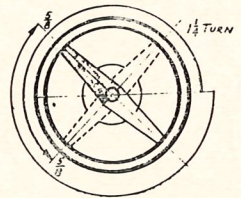


Fig. 26

observer be able to determine when the motion is under one turn as in the case of Fig. 21 and to distinguish it from the $1 \frac{1}{8}$ turn motion, Fig. 23, wherein the balance arms cross each other.

In our study of motion we began with the jewel pin which receives the motivating impulse, then we went to the more easily seen balance arms which the watchmaker uses for determining the amount of motion. In doing this we isolated the balance from the watch.

Now, let us put the balance in its proper surroundings in the watch and study further how to determine the motion of the balance. We see in Figures 27 to 31 that the balance wheel is a bit obscured by the balance bridge. However, this is no real obstacle. In fact, it is easy to read the motion of the balance because in the vicinity around the balance there are points that may be used as "land marks" to help us. When the hairspring is unstressed, the pallet lever is on the line of centers which can readily be seen when looking at the watch. We note also that one of the balance arms is almost directly under the stud screw on the balance bridge. Thus we have a tangible means of locating the neutral position about which the balance oscillates.

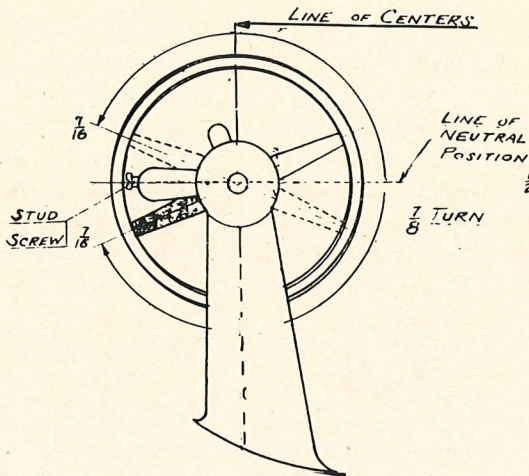


Fig. 27

Fig. 27 shows that a balance arm has moved $\frac{7}{16}$ of a turn from the neutral position line in one direction and then after the next impulse the same arm moved $\frac{7}{16}$ of a turn from the neutral position line in the opposite direction. Thus, the total amount of motion of the balance is $\frac{7}{8}$ turn or a motion of 315° .

Fig. 28 shows a full motion of one turn a motion of 360° .

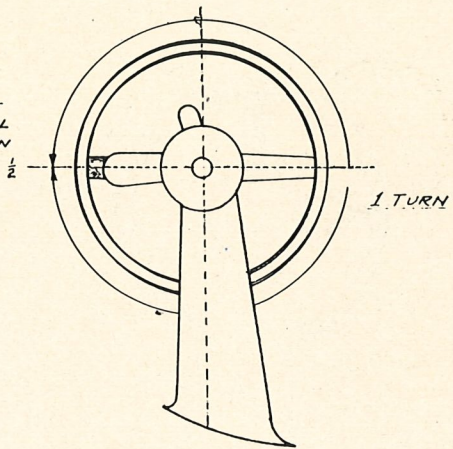


Fig. 28

Fig. 30 shows $1 \frac{1}{4}$ turn motion or a motion of 450° .

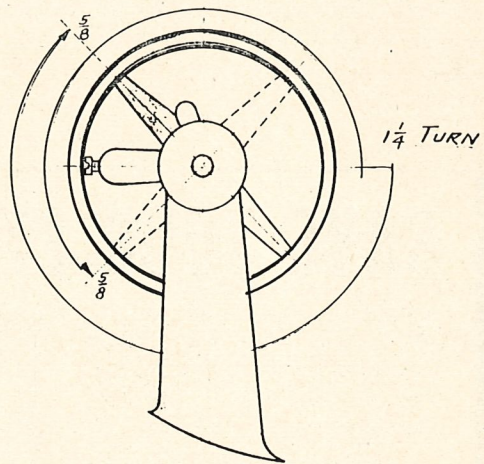


Fig. 30

Fig. 31 shows $1 \frac{1}{2}$ turn motion or a motion of 540° .

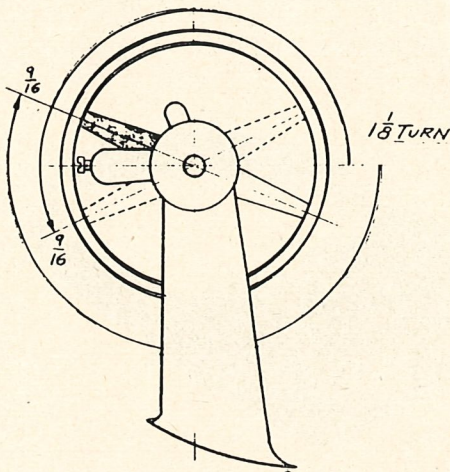


Fig. 29

Fig. 29 shows $1 \frac{1}{8}$ turn motion or a motion of 405° .

When the hairspring is unstressed and the mainspring completely run down, the hairspring should hold the jewel pin on the line of centers. Under this condition the balance arms will also be in their neutral position. This neutral position in various watches may be located 45° , 90° or 135° from the line of centers. However, the important key point is that when the hair-

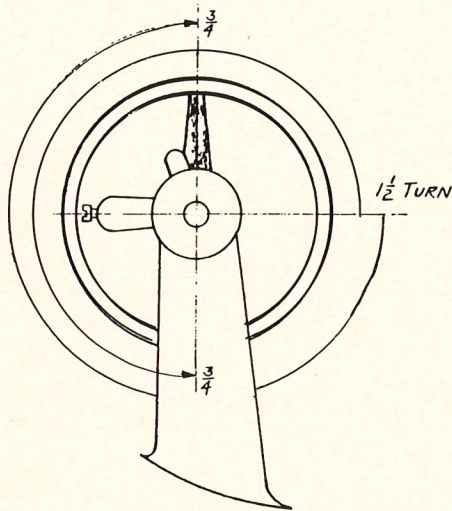


Fig. 31

spring is unstressed the balance arms will be in their neutral position and any motion to either side of this position constitutes the motion of the balance wheel as previously stated.

On any watch in which the balance arm is not located 90° from the line of centers a reference point can be established for the neutral position of the balance arm. Here again motion on either side of this neutral position can be determined on the basis of the specific instructions given for Fig. 15 and Fig. 16 and for the general information covering all figures from Fig. 15 to Fig. 31.

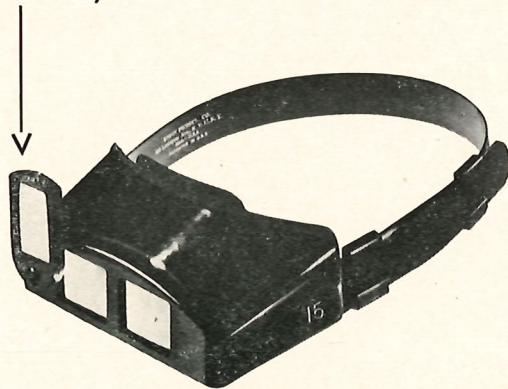
The fact that the balance arms have chamfered edges is of great help in determining the motion. These edges act like tiny mirrors that reflect light when the watch is properly placed relative to the eye and the source of light. It is easy to observe the gradually decreasing angle made by the mirror-like edges as the motion increases up to a full motion. Beyond the full motion of a turn this angle grows larger as the arms pass the cross over point at 180° .

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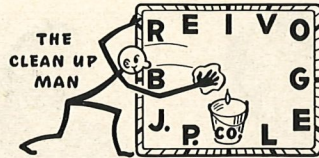
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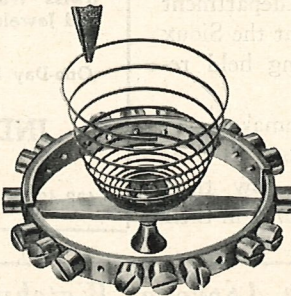
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Anne E. Dagle.....	Washington, D. C.	Navy Department
Dewey Gilleland, Jr.	Toccoa, Georgia	H. W. Meaders
Isadore I. Greenberg.....	Los Angeles, Calif.	Watson & Kahn
Elmer A. Habadaz.....	Youngstown, Ohio	Anthony Baltrus
Chester V. Hall.....	Santa Maria, Calif.	Self
Nick Hattell.....	Dacona, Colo.	Walter M. Bloxham
Russell W. Lindstrand.....	Sunnyside, Wash.	Sogen's Jewelry
Robert Porter Lowe.....	Natick, Mass.	James L. Pickering
Anthony Marrichi	University Park, Md.	Woodward & Lothrop
David Nelson	British Columbia, Canada.....	H. R. Francis
Walter F. Ottoson.....	Portland, Oregon	Montgomery Ward
Julian L. Owen.....	Washington, D. C.	J. K. Lewis
Thomas G. Pack.....	Charlottesville, Va.	Emmett E. Pack
Fred M. Padgett, Jr.	Chicago, Ill.	Fred M. Padgett, Sr.
John P. Russell.....	Washington, D. C.	Army Map Service
Ernest Siraki	Passaic, N. J.	Wm. Geiger, Inc.
Robert Edw. Smith.....	Midland, Mich.	A. L. Prince
Harvey P. Turns.....	Pickens, S. C.	(Not given)
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A. Benton Wilmarth.....	Weed, Calif.	James N. Wilmarth
E. R. Wilson.....	Wahoo, Nebraska	J. L. Dickinson

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James Lloyd Hayes.....	Amarillo, Texas
Thomas I. Miller.....	Amarillo, Texas

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William B. Davis.....	Chebeague Island, Maine
Ivan W. Grover.....	Chebeague Island, Maine

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R. A. Hardy.....	Lancaster, Pa.

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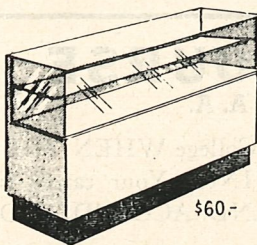
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Floyd G. Snyder.....	Lancaster, Pa.	Student at Bowman Tech. School
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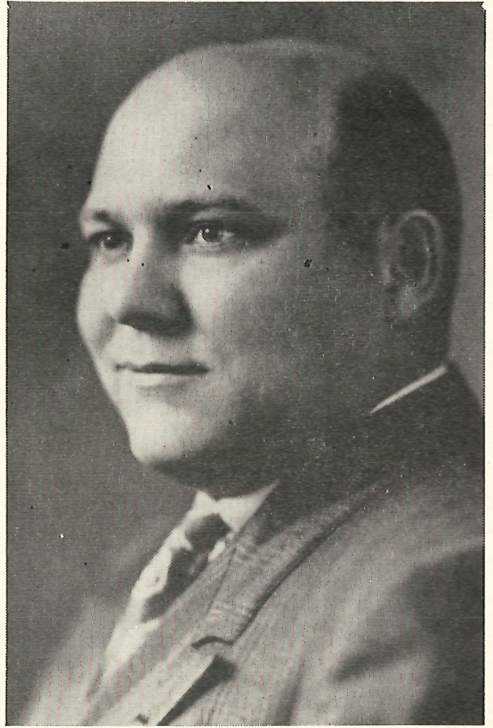
William M. Brandes, manager of the Elgin National Watch Company plant at Lincoln, Nebr., for the past two years, has been appointed director of manufacturing for all four Elgin plants, it was announced here today by James G. Shennan, president.

Brandes, who is 34 years old, will headquarter at the general offices in Elgin, and will have direct supervision over all manufacturing activities except research and watch design at the company's two plants here, plus the Aurora, Ill., and Lincoln plants.

At the same time, Shennan announced appointment of Elmer G. Jurs, formerly assistant factory manager at Lincoln, to full management of the Lincoln plant.

Brandes has risen steadily with the company since he began working at the Elgin plant in 1934. In 1940 he became plate department foreman, and four years later was placed in charge of the gliding department. Slightly more than a year later he became assembling department foreman, and early in 1946 was transferred to Lincoln as assistant factory manager. He became manager at Lincoln in March, 1947.

Jurs, the new Lincoln manager, began with the company at Elgin in 1919 and has



William M. Brandes

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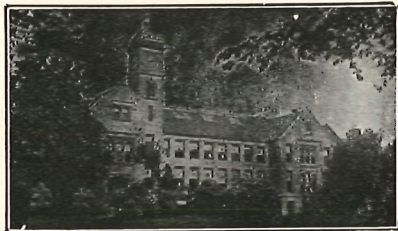
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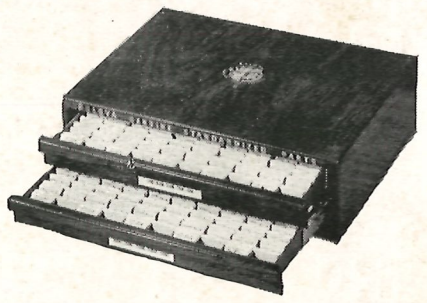
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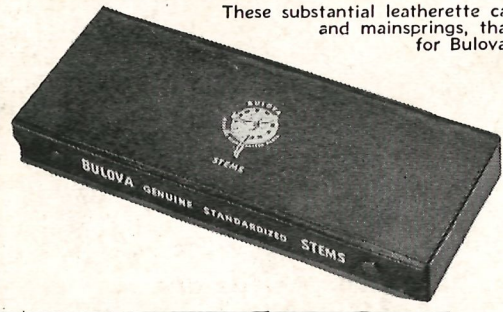
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