HE ELGIN SERVICE BUREAU BULLETIN

Subject:
Balance Truing

Issued by the
Elgin National Watch Company
Elgin, Illinois, U. S. A.

Introduction

WATCHES of good quality are, as a rule, fitted with compensating balance wheels, and to get the finest time results from such watches it is essential that the balance be in perfect truth. We will in this bulletin, by illustrations and suggestions, show the tools and methods by which compensating balance wheels are trued. There is no easy way of doing this work except such as comes from manual skill, which is attained by persistent practice.

The Bench

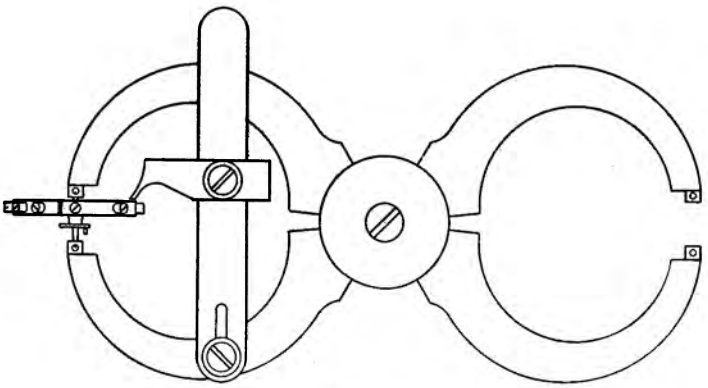
It is desirable that the bench be of such a height that the workman may sit comfortably at it with his elbows resting on an apron drawer and his eyes in line with his work. Benches 40 inches high having apron drawers hung 10 or 12 inches from the top will be found convenient for balance truing. If your bench is not of the correct height the difficulty may be easily overcome by using, on top of it, a wooden box or frame 8 or 10 inches square of such height as will be convenient. In making a frame of this kind it is a good plan to taper it gradually to the right and left from the top so that the hands may rest easily and firmly. This arrangement increases the size of the frame considerably as the flat working surface should be 8 or 10 inches square. The north light is considered best for close work and if your bench can be arranged so that you face the north you will be in a position to work to the best advantage.

Tools

Select a single eyeglass with as long a focus as can be used to advantage. Short focus glasses are apt to distort an object unless great care is used in focusing exactly. Glasses of 2 inch or 2½ inch focus with a field about ⅞ of an inch are most commonly used.

The principal tool we use and recommend, is a *heavy* caliper with hardened steel centers, which hold the balance by the cones of the pivots and not by their points. Calipers must have an indicator adjustable to the height and diameter of the balance. Indicators should be arranged with a straight surface for truing in the flat and with arcs of circles for truing in the round.

Be sure that your tools are in good order and learn to use them with confidence.

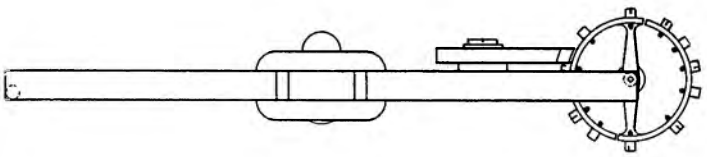


No. 1.

Illustration No. 1 represents a caliper of good form with indicator in proper position for truing in the flat. In selecting calipers, see that the joint fits closely and works smoothly. The indicator bar and indicator must be arranged with sufficient friction so that they keep their position

when adjusted. Be sure that the centers (pivot bearings) fit the cones of staff closely. It is desirable that each center have a hole drilled through it parallel to its face, so that they may be easily cleaned. If there be any shake in the joint of the caliper or in the centers, the bending of the arm or rim is an uncertain quantity.

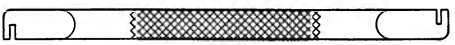
Illustration No. 2 represents the caliper with indicator set in the correct position for truing in the round.



No. 2.

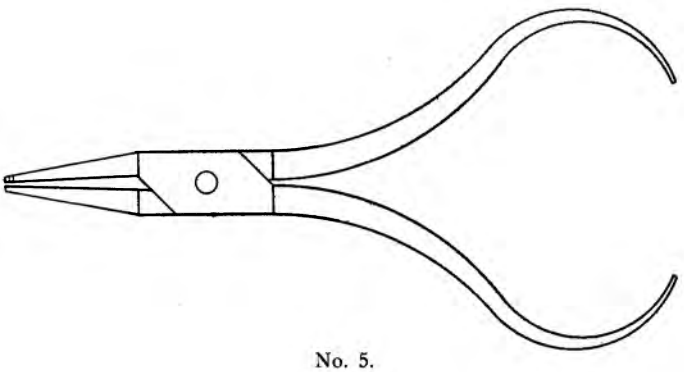
Illustrations Nos. 3 and 4 are two views of a rim-bending wire or wrench. The slot in the end should be of a width to fit the rim closely and be perfectly free from sharp corners or burrs. Adjustable wrenches of this type may be had from watch tool dealers. In using this tool, place it on the rim from the under side.

No. 3.



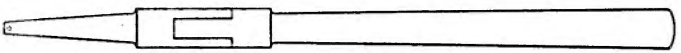
No. 4.

Illustrations Nos. 5 and 6 show two views of a rim-bending plier. This plier may be used in place of the bending wire or wrench. The jaws should be narrow and the flat one lined with thin, hard cardboard (such as is used for visiting cards) cemented on with liquid shellac.



No. 5.

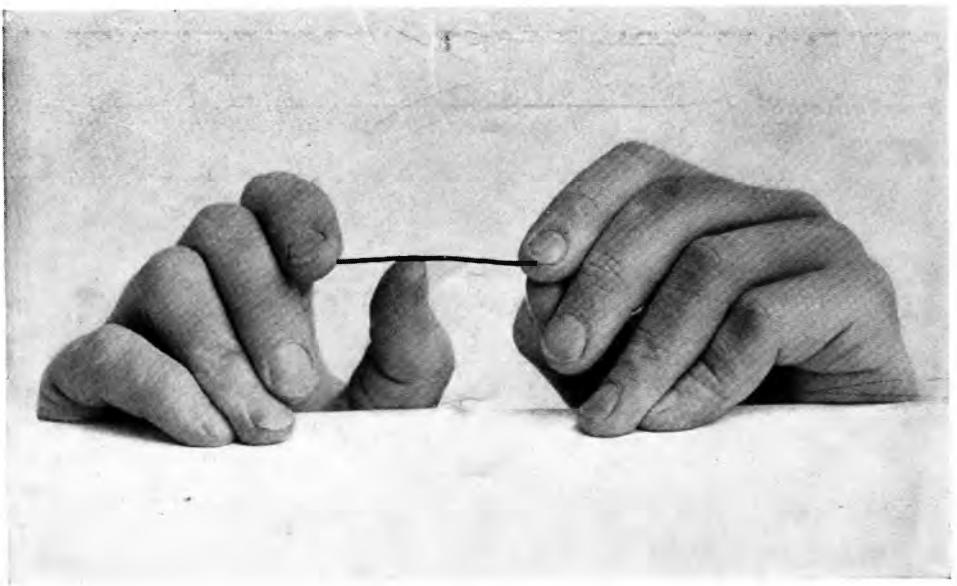
One jaw should be rounded on the inside for a short distance from the end to conform to the inside of the balance rim and have a hole drilled through it to give free passage to the point of a balance screw where it projects through the rim. The rounded portion of the plier should not much exceed in length, the depth of the rim of the largest balance.



No. 6.

Heavy tweezers may be arranged with ends the same as illustrated in the pliers.

Whether pliers, tweezers or wrench is used for bending the rim, be sure that the jaws of the tool are perfectly smooth, so that they will not mar the balance.

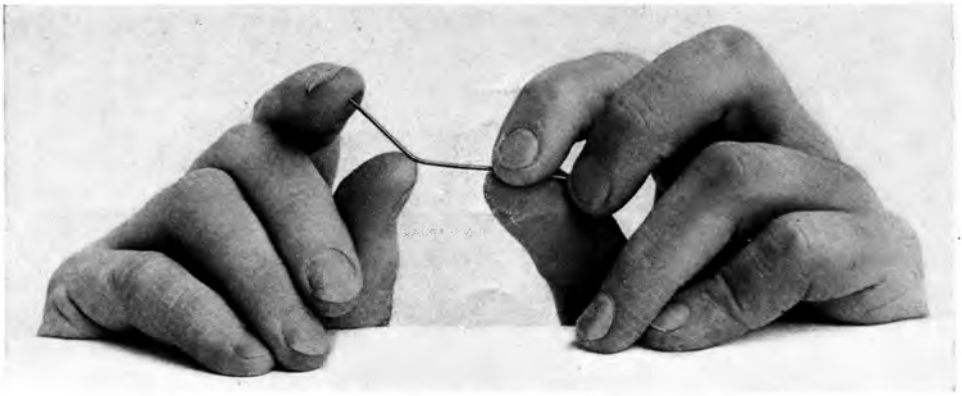


No. 7.

No. 8.

Manipulation

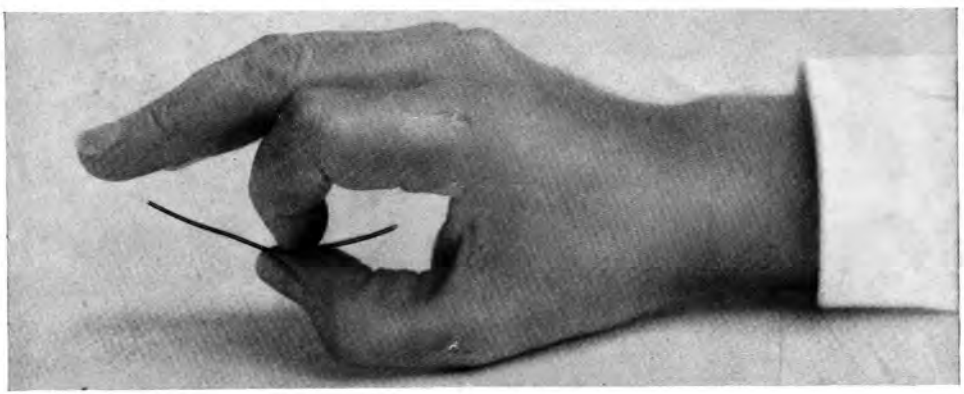
As the effects of bending cannot be plainly shown in an illustration of a balance, we use a piece of wire for this purpose. Illustrations Nos. 7, 8 and 9 show, in an exaggerated form what effect bending has upon the rim of the balance.



No. 9.

Illustration No. 10 represents the pinching of a piece of wire, making a kink. Kinks may be removed from a balance in a similar manner.

In placing the balance in the calipers be very careful not to bend or otherwise damage the pivots. Rest the calipers on your bench, holding them with the left hand. Open them with the thumb and forefinger of the same hand. With the right hand place the balance in the calipers, locating the lower pivot first. Then close the calipers carefully so that the upper center locates properly on the upper pivot.



No. 10.

Having a balance in your caliper with the indicator adjusted to the upper outside corner, as shown in illustration No. 1, the first thing to do is to make sure that the arms are level—that is, at right angles to the axis of the staff.

Turn the balance slowly; if you find the arms are not level, bend them up or down, as required, holding balance firmly in the calipers.

Illustration No. 11 shows the manner of leveling. In making the necessary bends be sure that the calipers are held firmly.

No. 11

Now proceed to bend the rim to truth, which can, and should, be done mostly with the fingers, first in the flat, and then in the round. If, as sometimes occurs, truing in the round throws the rim slightly out of true in the flat that must be corrected. Always begin at the arm and true *toward* the cut end of the rim, one side of the balance at a time. Avoid short bends, as they cause kinks, which are difficult to remove.

Illustration No. 12 shows the rim being trued *up*, and

No. 12.

Illustration No. 13 the operation of truing the rim *down*.

No. 13.

If the balance is very defective on account of short bends in the rim, it may be necessary to take them out with the bending wrench or pliers.

No. 14.

Illustration No. 14 shows the operation of bending *out* with the wrench, and illustration No. 15, the same operation with the pliers.

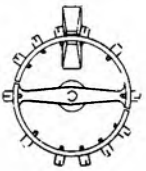
No. 15.

Illustrations Nos. 16 and 17 show the bending of the arm *in* with wrench and pliers.

No .16.

No. 17.

Illustration No. 18 shows a balance with pliers in position on rim for bending.



No. 18.

Elgin Service Bureau Bulletin

An Elgin Expert at Your Elbow

To Help You Without Any Cost to you

WE again call your attention to the well known service we are offering to our good friends in the trade. We want to help you to make your apprentices proficient. This successful feature of our co-operative work for the retail jeweler is known as the

Service Bureau

Organized for the Purpose of Helping Watchmakers With Their Watch Work.

The work of the service bureau is two-fold. It answers with personal letters inquiries from retail jewelers about specific watchmaking difficulties. If a watchmaker has a peculiar difficulty with a particular watch, some unusual baffling ailment of the mechanism that his experience does not quite parallel, here is the sure and ever-ready solution—drop the Service Bureau a post card and you will receive the aid you need by return mail. All that you have to do to be assured of this service regularly is to enroll your name and that of your watchmaker with the bureau. This little act will prove helpful many times in the future

The other service rendered by the bureau is the publication of bulletins on watchmaking subjects. We are stating the simple fact when we say that the careful perusal of these bulletins, together with the timely help our Service Bureau can give him in seasons of especial need, will make an expert of your watchmaker.

If he is an expert now they'll *sharpen his experience* and verify it. If he is a young ambitious workman here is the very thing he needs: definite practical suggestions in the details of watchmaking furnished by our factory experts, attested and guaranteed by years of successful use at the factory.

Remember that your inquiries will be answered with personal letters by men who are experienced in their line—men who have devoted their entire lives to the particular subject about which you may inquire. No charge whatever is made for this special service.

Let *our* experts be *your* experts.

ELGIN NATIONAL WATCH CO.

ELGIN, ILLINOIS