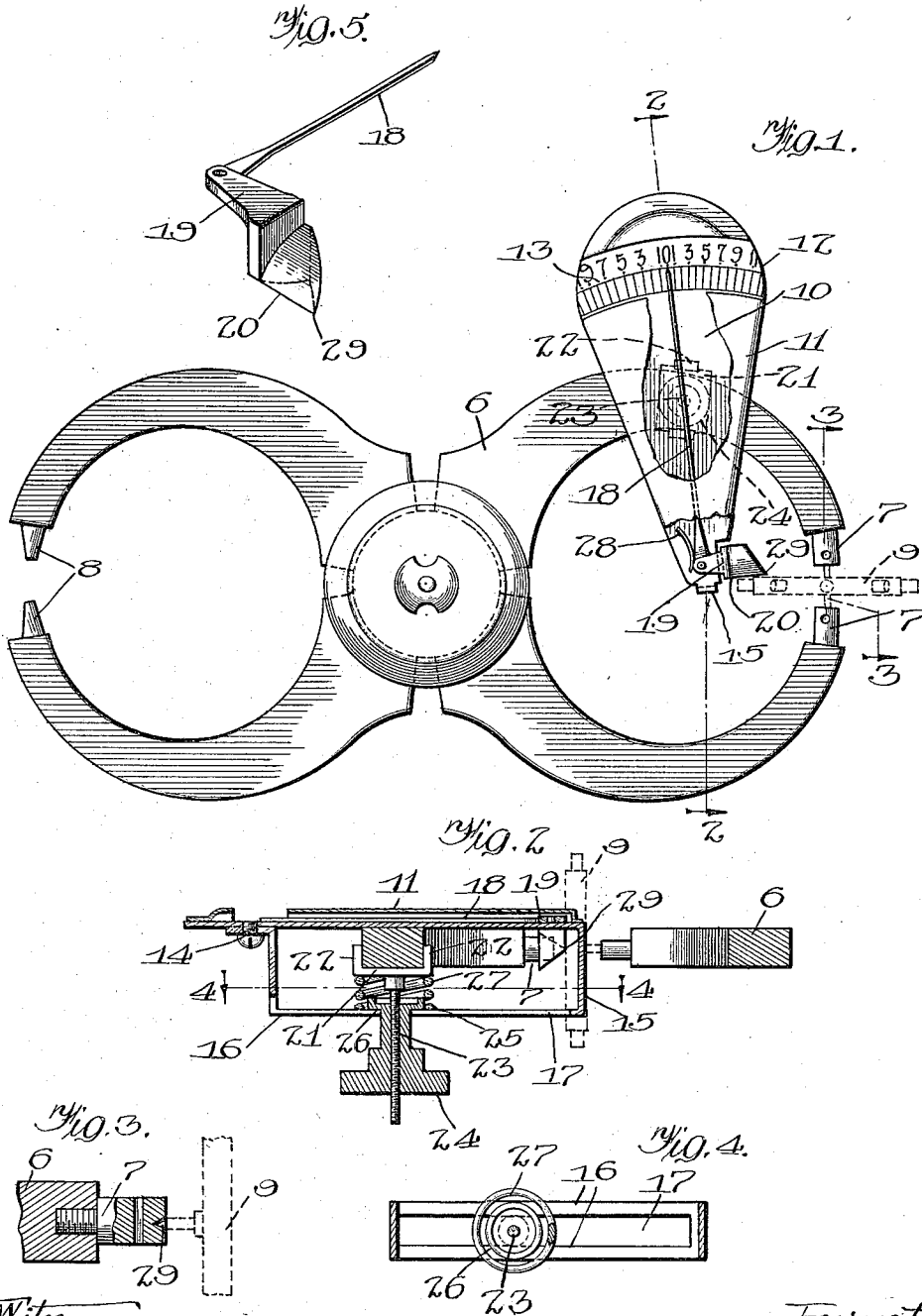


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WATCHMAKER'S TOOL FOR ADJUSTING BALANCE WHEELS.
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UNITED STATES PATENT OFFICE.

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WATCHMAKER'S TOOL FOR ADJUSTING BALANCE-WHEELS.

1,153,695.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LOUIS KOHN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Watchmakers' Tools for Adjusting Balance-Wheels, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to improvements in indicating means for mechanism used in the adjustment of balance wheels, and has for its object the production of a device whereby any irregularity in the balance wheel may be clearly indicated.

A further object is the production of a device which may be readily attached to the ordinary watch-maker's calipers, whereby any irregularity in the balance wheel occasioned either by warping or bending or any deviation from the circular shape, may be readily detected and measured.

A further object is the production of a device by the use of which the balance wheel may be quickly straightened and trued, without the necessity of removing the balance wheel from the calipers.

A further object is the production of a cheap and efficient device, of simple construction, and one that is not liable to disarrangement of parts.

These and such other objects as may hereinafter appear are attained by my device, an embodiment of which is illustrated in the accompanying drawings, in which—

Figure 1 represents a plan view of my device, in place on a pair of watch-maker's calipers; Fig. 2 is a sectional view on line 2—2 of Fig. 1, looking in the direction indicated by arrows; Fig. 3 is a sectional view on line 3—3 of Fig. 1, looking in the direction indicated by arrows; Fig. 4 is a sectional view on line 4—4 of Fig. 2, looking in the direction indicated by arrows; and Fig. 5 is a perspective view of my improved guide and needle.

Like numerals of reference indicate like parts in the several figures of the drawing.

Referring by numeral to the accompanying drawings, 6 represents a pair of watch-maker's calipers terminating in binding posts 7—7 and 8—8; 9 is a balance wheel in position to be operated upon, shown in dotted position.

My improved indicator comprises a plate 10 preferably having a cover or hood 11 cut away at 12 to expose the scale 13 on the plate 10. Riveted to this plate at 14, and preferably integral therewith, is a back piece 15 extending at right angles to the plate for a short distance, and then parallel thereto. Said parallel portion 16 (best shown in Fig. 4) is provided with a slot 17, the purpose of which will be shown later. Pivotaly secured to the top of said plate, is an indicating needle 18, and seated on the same pivot and secured to the needle is a guide 19. This guide is preferably of a triangular cross-section, and terminates at its lower edge in a knife edge 20. This guide is rigidly secured to the needle, and when not held upwardly by reason of resting on the balance wheel, drops forward, forcing the needle 18 against the right-hand side of the hood. In order to hold the needle and indicating plate securely in place on the calipers, I provide a grip yoke 21 comprising a flat portion adapted to rest against the base of the caliper arm, and a pair of flanges 22 adapted to grip the arm. Secured to base of this yoke is a threaded bolt 23 passing through a thumb-nut 24. This thumb-nut is provided with an enlarged portion 25 forming a seat 26 adapted to rest on the sides of the slot 17. A spring 27 surrounds this bolt, pressing against the sides 16 of the slot 17 and the bottom of the yoke 21. A spring 28 is preferably used to hold the needle and guide in position against the side of the hood. The binding posts 7 are provided with sockets 29 adapted to receive the axis of the balance wheel 9 under adjustment.

The operation of my device is as follows: When a balance wheel is out of true, either with respect to its horizontal plane or with respect to its circular form, the guide 19 is raised out of the way and the balance wheel 9 put in position between the binding posts of the caliper. The knife-edge 20 of the guide then rests on the side of the balance wheel and the pointer 18 registers on the scale 13 say at zero. It is evident that the pointer need not necessarily register at zero, but at any point on the scale, depending on the contour of the surface of the balance wheel. In Fig. 1 it is shown registered at zero. It is evident, therefore, that if the balance wheel is exactly true horizontally, and is revolved about its pivot points in the

binding posts 7, the indicator will still point to zero during the entire revolution of the wheel, excepting, of course, at the times when the knife-edge enters the spaces between the separate portions of the balance wheel. If, however, the wheel is at all out of true, the moment such portion of the wheel is brought in contact with the knife-edge 20 of the guide, the indicator will move away from the zero or point indicated at the commencement of the operation. The operator then, by using his pliers, can straighten the wheel without removing it from its pivot in the calipers. This operation can be continued until the wheel is perfectly true and the indicator remains at the same point at the scale during the entire revolution of the wheel. When this operation is completed, the thumb-nut 24 is loosened, and the device turned through an angle of practically ninety degrees, so that the point 29 of the knife-edge 20 engages the inner periphery of the wheel 9. The position of the needle is again noted on the scale, and the wheel then revolved. Any departure from a circle is clearly indicated on the scale, and the wheel trued accordingly.

This device is of a simple construction, and not at all liable to disarrangement of parts. It can readily be slipped over any calipers.

In the device illustrated, the yoke 21 is made rigid. Consequently it can only pass over a certain portion of the caliper arm. The space, however, between the flanges is

made large enough so that a sufficient portion of the caliper arms may be traversed to bring the guide in proper position to contact with the balance wheel under the operation. It is evident, however, that if occasion should arise, the yoke can be made adjustable so it could fit over the larger portions of the arm or arms of large calipers if desired. Such a modification of the yoke can be made without departing from the spirit of my invention. The triangular cross-section of the guide makes it possible for the guide to drop down in the space between the circumferential portions of the sections of the balance wheel, and at the same time slip easily upon the surface of the adjacent section without disturbing the operation of the device. It is also evident that the needle or pointer 18 and guide 19 may be formed of one piece, the guide being a continuation of the shank of the pointer.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is;—

An indicating device comprising a plate having a scale thereon, a guide provided with a knife edge pivotally secured thereto, a pointer adapted to register the movements of said guide, and spring-pressed adjusting means including gripping flanges whereby said plate may be secured in any desired position on the arm of a pair of calipers.

In witness whereof, I have hereunto subscribed my name.

LOUIS KOHN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."