June 29, 1954 D. KIRBY 2,682,187

WATCH AND CLOCK MICROREGULATOR

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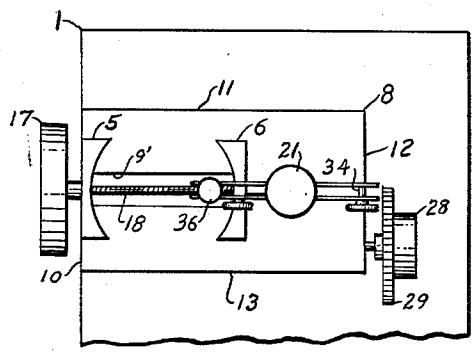


Fig. 3

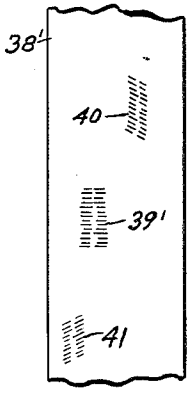


Fig. 5

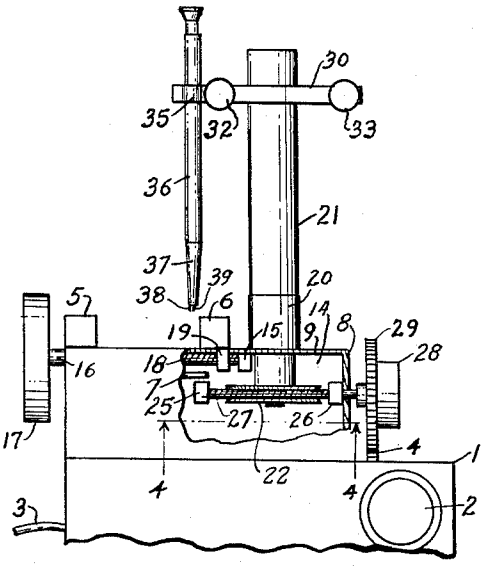


Fig. 1

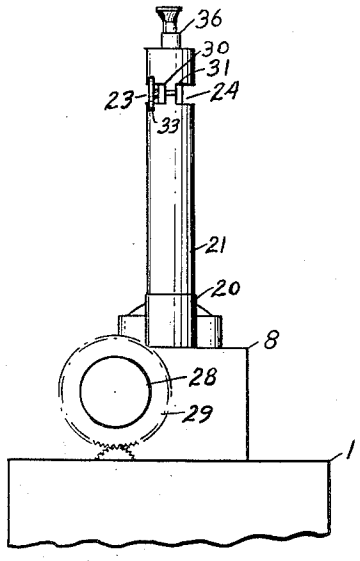


Fig. 2

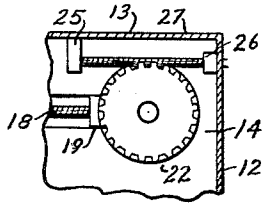


Fig. 4

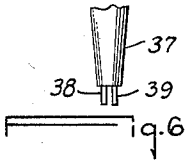


Fig. 6

INVENTOR.
David Kirby.
BY Earl E. Moore
Atty.

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WATCH AND CLOCK MICROREGULATOR

David Kirby, Burbank, Calif.

Application August 11, 1952, Serial No. 303,698

2 Claims. (Cl. 81—6)

1

This invention belongs to that general class of devices known as watch maker's tools and relates particularly to means for adjusting the regulator arm on watches and the like.

The invention has among its objects the production of a means of the kind described and claimed that is simple, durable and compact in structure, a device which is inexpensive to make and manufacture, one that is dependable and efficient in use and service, and one that is very convenient to use whenever and wherever found applicable.

Other objects, advantages and features of this invention will appear from a careful perusal of the accompanying drawings, the subjoined and detailed description, the preamble of these specifications, and the claims appended hereto.

Below, applicant describes one of the preferable forms of his invention in order to teach the art thereof and show how to make and use the same, but it is to be understood that the drawings and description thereof are not to limit the invention in any sense whatsoever except as the same may possibly be limited by the prior pertinent art.

In the drawings:

Figure 1 is a front side elevational view of a form of the invention with a portion broken away to show some internal mechanism, the watch to be regulated is not shown in the clamping device thereof;

Figure 2 is a right end elevational view of that shown in Figure 1, both views are shown as mounted upon base which has a part thereof broken away;

Figure 3 is a top plan view of the device with a portion of the base broken away;

Figure 4 is an under plan view of a portion of the device taken substantially along line 4—4 of Figure 1;

Figure 5 is a plan view of a portion of a timing record strip which indicates whether or not a watch movement is correctly regulated and indicates the amount a movement may be slow or fast.

Figure 6 is an enlarged, fragmentary view in elevation of a portion of Fig. 1.

The device of this invention is shown as mounted upon and combined with a base 1 which is an electronic regulator and indicating unit having a strip viewing window 2 and the extension cord 3 which is to be connected to a suitable source of electric current. Electronic indicating devices, upon which this invention is to be mounted, are old in the art and no claim is

2

made thereto except for a slight addition thereto which includes the pinion gear 4. The electronic device or unit is operated by the tick of the watch which is to be clamped between the jaw members 5 and 6 and the pick-up element 7 conducts electric pulsations by means of suitable conductors into the electronic regulator unit 1. Should the tick of the watch be fast, the electronic unit 1 causes the pinion gear 4 to turn slightly in one direction and if slow, the pinion gear turns slightly in the other direction. Obviously, should the tick of the watch be exactly correct, the gear 4 would not turn at all for the reason that the watch tick is in perfect synchronism with the master timer element of the electronic circuit or unit 1.

Mounted upon the unit 1 there is a housing shell or casing 8 having a top wall 9 and the depending walls 10, 11, 12 and 13 which provide a dust free chamber 14. Bearing means are provided in the wall 10 and at the removed point 15 which constitutes a bearing lug fixed to the underneath portion of the top wall 9. A stem 16 has its end portions journalled in the bearing means and keyed to its outer end there is the hand knob 17. Spaced from the bearing portions of the stem there is a threaded portion 18 which is meshed with a threaded bore section of a lug 19 that is integral with the clamping jaw 6. By this construction, the jaw 6 is moved in either direction depending upon the rotation of the stem 16.

Upon the top wall 9 there is mounted a bearing sleeve 20 which journals a standard or post 21, the standard having a reduced portion which enters the sleeve and which passes through a bore in the wall 9. The lower end of this post has keyed thereto a worm wheel 22 and the top of the post has the recessed portions 23 and 24. Fixed to the side wall 13 there is a pair of spaced apart journal blocks 25 and 26 which provide support bearings for a worm 27 which is in mesh with worm wheel 22; the outer end of this worm having keyed thereto a hand knob 28 which is fixed to a gear 29, as shown. The gear 29 is in mesh with the pinion gear 4 of the electronic master timing device or unit 1.

On opposite sides of the post 21 there are the pair of parallel holding bars or beams 30 and 31 which are snugly positioned within the recessed portions 23 and 24, respectively, but which can slide along the recessed portions when released. On opposite sides from the post 21 there are the pair of spaced finger knobs 32 and 33, each of which has threaded stems or studs 34

that are meshed in their respective threaded bores in the bar **31**. By the foregoing means, the bars can be adjusted in position with respect to the post by loosening the finger knobs. Each bar has at its end a curved clamping member **35** which supports a pencil-like element **36**.

The element **36** is elongated and has the lower tapered portion **37** which houses an expandable pair of jaws **38** and **39**. These jaws are adapted to straddle the adjusting arm of a watch and have sufficient clearance to allow for the arc movement of the adjusting arm. It should now be apparent that movement of the knob **28** by hand or the automatic movement of the larger gear **29** by the electronic unit will give a micro-movement of the element **36** for fine adjustment action of the adjusting arm of a time piece.

The paper tape shown in Figure 5 of the drawings is now a well known means for visibly noting the regulation of a time piece. Such a tape **38'** has groups of lines thereon made by an electronic device as indicated at **1**. The line group at **39'** indicates correct time or regulation whereas the group **41** indicates that the time piece is running slow and the group **40** indicates fast.

The watch to be regulated is clamped between the jaw members **5** and **6** and the thumb screws **32** and **33** on the post **21** are loosened so that the element **36** can be moved into proper position just above the regulator arm of a watch. The jaws **38** and **39** engage the hair spring regulator arm of the watch at a suitable point offset from the pivot point thereof. After the screws **32** and **33** are tightened, regulation of the watch can then be neatly accomplished by hand in the following manner:

When the tape **38'** as viewed through the window **2** indicates that the tick of the watch is fast (note lines **40** in Figure 5 of the drawings) the knob **28** is turned slightly and this causes the post **21** to turn very slightly because of the reduction gearing and hence the bars **30** and **31** move the element **36** in a small arc a very slight distance and thus causes the regulator arm of the watch to be shifted a micro-distance toward the "S" or slow marking on the rear plate of the watch.

Obviously, the reverse action is practiced when the strip **38'** shows that the tick of the watch is slow and as indicated in the lines at **41** on the tape. When the tick of the watch is exact, the lines **39'** would appear on the tape at the viewing window **2**.

It is, of course, understood that various changes and modifications may be made in the details of form, style, design, materials and construction of the whole or any part of the specifically described embodiment of this invention without departing from the spirit thereof; such changes and modifications are considered as being within the scope of the following claims.

I claim:

1. In a time piece regulating device comprising a housing with a time piece receiving means mounted thereon, an adjustable arm means extending from the housing and having a coupling means for engaging the arm of a time piece regulator, rotary means exterior of the housing adapted to be turned in either direction, micro-mechanism within the housing connecting the rotary means with the adjustable arm means so that the regulator arm of a time piece can be micronomically set.

2. In a time piece regulating device comprising a main support with means connected thereto for firmly holding the time piece to be regulated, a standard extending from the main support having means at its lower end for micro-turning it, a bar means extending laterally from the top portion of the standard, a stem extending downwardly from a distal end of the bar means, a jaw means at the bottom end of the stem which is adapted to straddle the regulating arm of a time piece, and a knob attached to the micro-turning means for hand operation of the standard.

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