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FLEXIBLE COUPLED SECONDS HAND
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FIG. 1. FIG. 2. FIG. 3. FIG. 4.

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FLEXIBLE COUPLED SECONDS HAND

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The invention described herein may be manufactured and used by or for the Government for governmental purposes without payment of any royalty thereon.

This invention relates to timepieces of the type having an escapement and a sweep seconds hand, and has for an object to provide a smoother and more nearly uniform movement of said seconds hand, whereby it will consume less energy and the timepiece will run longer on one winding. Another object is to facilitate regulation of such a timepiece as is mentioned above, when using an electronic timing machine known as the “Watchmaster,” whereby a resilient connection between the seconds hand and its drive mechanism is effective in suppressing undesirable sounds thereby to reduce the likelihood of unwanted sounds from the seconds hand or its drive being picked up by the microphone and obscuring the desired tick from being as clearly indicated on the printed record as is desired.

In the drawing, Fig. 1 shows an assembly on an enlarged scale of a portion of a sweep seconds hand and its drive shaft according to this invention.

Fig. 2 is a rear view of a portion of the seconds hand shown in Fig. 1.

Fig. 3 shows the spring constituting a resilient connection between the seconds hand of the Fig. 2 and its tube (or hub).

Fig. 4 shows a collar to be secured on the tube for the seconds hand in Fig. 1.

Referring to the drawing in Fig. 1, a sweep seconds hand 10 is mounted on a drive shaft 11, driven in the usual manner from the customary escapement controlled driving means 11a shown diagrammatically in this figure. Contiguous to the inner side of the seconds hand 10 is a collar 12 secured on the tube 14 in any convenient manner, the opposite or outer side of the seconds hand abutting a head or enlargement on the tube 14. Between the hand 10 and the collar 12 is placed a spring 13 of a size to have a natural frequency of not more than 1/2 that of the driving mechanism’s natural frequency and adapted to smooth out the force applied from the mechanism to the hand.

As shown in Fig. 2 the seconds hand 10 is provided with a small perforation 15 into which the bent end 14a of the spring 13 is adapted to be received. The opposite end of the spring 13 fits within a slot 16 in the collar 12 as shown in Fig. 4. The spring per se is shown in Fig. 3. This invention finds application in the timepieces of a larger size than the ordinary wrist watch where the weight of a seconds hand is larger than it is in such wrist watches, although, of course, if desired, this invention may also be applied to these smaller timepieces. As to the motion of the shaft 11 driven by the escapement, the usual movement of the shaft and seconds hand 10 is not uniform but jerky, depending upon the period of the escapement. Some escapements, for example, have a period of 1/4 of a second. During that 1/4th of a second, a seconds hand will be given an impetus or forward movement and during the latter of the same period will tend to slow down without the present invention. Under this invention, however, the spring 13 flexes during the initial kick imparted to it by the escapement. After flexing, the spring tends to return to an unstressed position and therefore smooth out the force applied to the hand. This results in a more nearly uniform movement of a seconds hand.

Among the advantages of this invention may be mentioned the fact that with a more nearly uniform rotation to the seconds hand and feed back of energy from the spring, there is less friction consumed by the hand 10 and therefore the timepiece will have longer running time with the spring connection of the present invention than without it although it is seldom that timepieces are allowed to run down. Perhaps a more important advantage of the present invention is the adaptability of the present spring 13 to cushion shocks imparted to the shaft 11. This cushioning action tends to reduce the creation of noises which would otherwise be caused by the jerky movement of the seconds hand. This action permits a better and more easily read record being produced by a “Watchmaster.” The reduction of incidental sounds prevents unwanted sounds being magnified or amplified by the electronic timing device so that the printed record of such a device will be cleaner and more easily read with quickness and accuracy than would be the case were a quantity of these incidental noises also magnified and allowed to clutter the record being printed.

I claim:

In a timepiece including an escapement having a predetermined period of operation and a time indicating hand having an aperture intermediate its ends, the combination of an escapement controlled driving means having a shaft extending through said aperture, and means including a spring fixed at one end to said shaft and at the other end to said hand, the natural frequency of said spring being not more than one-half that of said escapement.

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