

# Chronograph.

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*Witnesses*

John Becker  
and Hayner

Inventor

*Inventor*  
Edward G. Boynek  
by his Attorneys  
Roun & Roun

# UNITED STATES PATENT OFFICE

EDWARD G. BOYNETT, OF NEW YORK, N. Y.

## IMPROVEMENT IN CHRONOGRAPHS.

Specification forming part of Letters Patent No. **218,224**, dated August 5, 1879; application filed May 1, 1879.

*To all whom it may concern:*

Be it known that I, EDWARD G. BOYNETT, of New York, in the county and State of New York, have invented certain new and useful Improvements in Chronographs or Timing Attachments for Watches, of which the following is a specification.

My invention relates to an improved timing attachment for watches to be used for races and other purposes; and its object is to provide a simple and effective means whereby the second-hand of a watch may be stopped and released at will, whereby it may be instantly turned from whatever position it may occupy to zero.

To this end my invention consists in the combination, with a second-hand of a watch, means for driving the same, a brake for stopping the same, and a device for adjusting said second-hand to a starting-point, of a combined lever and plunger, serving the double purpose of shifting the brake and the said device, whereby the second-hand is adjusted to the starting-point.

It also consists in various details and combinations of parts, whereby the chronograph or timing attachment may be easily manipulated.

In the accompanying drawings, Figure 1 represents a face view, on an enlarged scale, of a portion of a watch embodying my improvements, the dial being removed and the second-hand turned to the zero-point; Fig. 2, a similar view, showing said parts in the act of imparting motion to the second-hand; Fig. 3, a similar view, showing the parts adjusted for turning the second-hand to zero; Fig. 4, a transverse section on the dotted line *xx*, Fig. 1, looking in the direction of the arrows; Fig. 5, a detached view of a plate for supporting certain parts; Fig. 6, a view illustrating certain portions of the friction driving device, and Fig. 7 a view of the second-hand detached.

Similar letters of reference designate corresponding parts in all the figures.

A designates the second-hand arbor or staff of a watch-movement, and B a wheel whereby motion is imparted thereto. The said arbor or staff is supported in proper bearings in the top plate of the watch, and in a plate, C, secured upon the pillar-plate C' of the watch, or in the pillar-plate itself. The second-hand D,

instead of being placed upon the arbor or staff A, is carried by a sleeve, *a*, fitting outside the said arbor or staff. The sleeve here represented forms the hub of a wheel or disk, *b*, to which it is rigidly secured, and which is provided on its under side with a recess or cavity, as clearly represented in Fig. 4. The said sleeve *a* and wheel or disk *b* fit loosely upon the arbor or staff A, so that the latter may turn independently of them, and are connected with said arbor or staff by means of a friction driving device, so as to receive motion therefrom when desired.

The driving device here represented consists of a roller, *c*, rigidly affixed to the arbor or staff A, and a spring, *d*, held at one end in a post, *e*, extending from the wheel or disk *b*, (see Fig. 6,) and adapted to press upon the said roller *c* with sufficient force to cause the said wheel or disk, and with it the second-hand, to rotate with said arbor or staff A.

E designates a brake, adapted to be brought into contact with the wheel or disk *b* for the purpose of stopping the latter, or to be removed from contact therewith in order to release it. It is shown as consisting of a spring secured at one end to the top plate, C', so that its upper end may be swung or adjusted into or out of contact with the wheel or disk *b*, and preferably having its adjacent face curved to fit the periphery of the latter, so as to afford a long frictional bearing therewith. The elasticity of the brake causes its face to press on the periphery of the wheel or disk *b*, unless otherwise actuated, with sufficient force to stop the latter.

F designates a device, which consists in this instance of a combined lever and plunger, pivoted to the top plate, C', by a screw, *f*, passing through a slot or elongated hole in the latter, which affords it a longitudinal as well as an oscillating motion, and projecting through the case, when it may be conveniently reached. It is provided with a toe, *f*<sup>1</sup>, extending from one side thereof in such a position that by swinging said lever in one direction the toe *f*<sup>1</sup> is caused to impinge against the brake E and adjust it into the position represented in Fig. 2, out of contact with the wheel or disk *b*, thereby releasing the latter. By swinging the lever in the other direction the toe *f*<sup>1</sup> is brought oppo-

site a recess or bend in the brake, whereupon the brake is allowed to swing forward into contact with the wheel or disk *b* and stop it.

*G* designates a catch or detent, attached at one end to the top plate, *C'*, and provided at or near the other end with a series of notches, *g*, adapted to engage with a tooth, *f*<sup>2</sup>, extending from the lever *F*, so as to hold the latter in either position to which it may be oscillated or swung.

I will now describe the means whereby the second-hand is returned to the position of zero or the starting-point on the dial. (Represented in dotted outline at *p*, Fig. 3.)

*h* designates a heart-shaped cam, combined with the wheel or disk *b*, so as to be rotated in unison therewith.

It is obvious that the sleeve *a*, wheel or disk *b*, and cam *h* may, with advantage, be formed from one piece of metal, as represented in Fig. 4.

*H* designates a device shown as consisting of a cam-lever, pivoted to the top plate, *C'*, at *j*, and provided with a face, *j'*, of such shape that on being pressed against the cam *h*, as represented in Fig. 3, it will turn or rotate the latter, whatever its position may be, so as to adjust the second-hand at zero on the dial.

For actuating the cam-lever *H*, I have shown a spring, *I*, secured to the top plate, *C'*, and bearing against a toe, *h*<sup>2</sup>, extending from the cam-lever *H*. The cam-actuating lever *H* is operated by pushing the lever or plunger *F* longitudinally inward, thereby causing a cam-shaped face, *i*, with which it is provided, to pass a toe, *h*<sup>3</sup>, upon the cam-lever, and, being opposite said toe, a recess, *k*, into which said toe may project, thus allowing the spring *I*, actuating the lever *H*, to impel the latter against the cam *h* and turn the second-hand so as to indicate zero. The lever or plunger *F* is moved outward by the resilience of the catch or detent *G*, and thus, through its face *i*,

swings the cam-lever *H* out of contact with the cam *h*.

By oscillating the lever or plunger *F*, I may effect the stopping and starting of the second-hand, and by pushing it inward I may cause the second-hand to return to a position to indicate zero on the dial.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a second-hand, means for driving the same, a brake for stopping the same, and a device for adjusting said second-hand to a starting-point, of a combined lever and plunger, serving the double purpose of shifting the brake and the said device, whereby the second-hand is adjusted to the starting-point, substantially as specified.

2. The combination, with the second-hand arbor or staff *A*, of a sleeve, *a*, rigidly affixed to a wheel or disk, *b*, mounted upon said arbor or staff and carrying the second-hand, a spring, *d*, carried by said wheel or disk, roller *c*, mounted on the said arbor or staff, brake *E*, lever *F*, provided with the toe *f*<sup>1</sup>, and the catch or detent *G*, substantially as specified.

3. The combination, with the second-hand arbor or staff *A*, of a sleeve, *a*, mounted thereon and deriving motion therefrom by means of a friction driving device consisting of a spring, *d*, carried by said sleeve and bearing upon the periphery of a roller, *c*, mounted on the said arbor or staff, a cam, *h*, affixed to the sleeve *a*, a cam-lever, *H*, a spring, *I*, for actuating said cam-lever, a lever and plunger, *F*, capable of being pushed inward to release the said cam-lever, and a spring-catch, *G*, for causing the automatic return of said lever and plunger, substantially as specified.

E. G. BOYNETT.

Witnesses:

T. J. KEANE,  
FREDK. HAYNES.