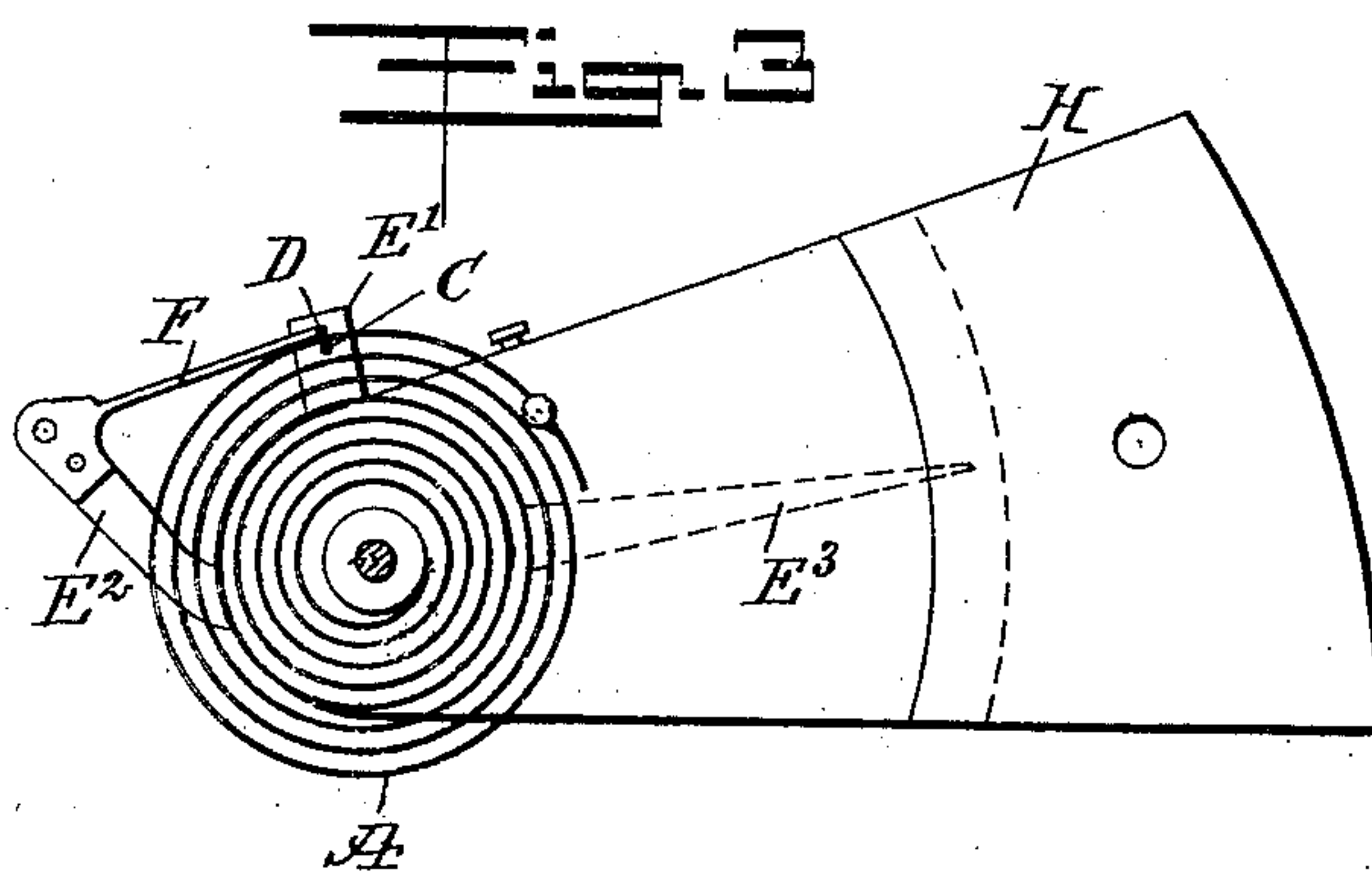
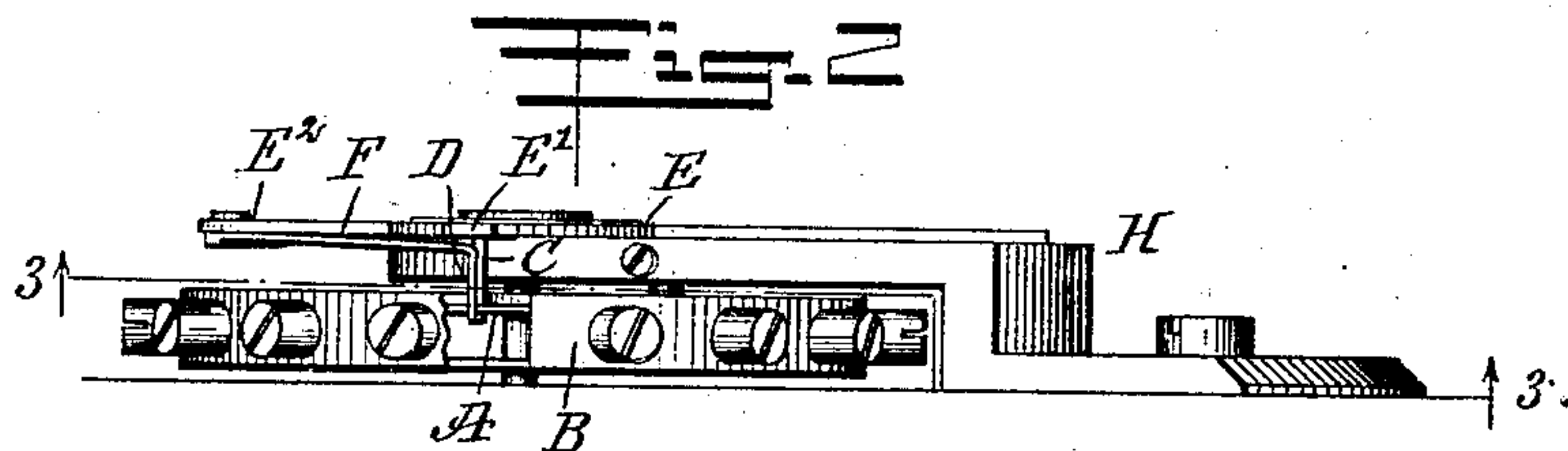
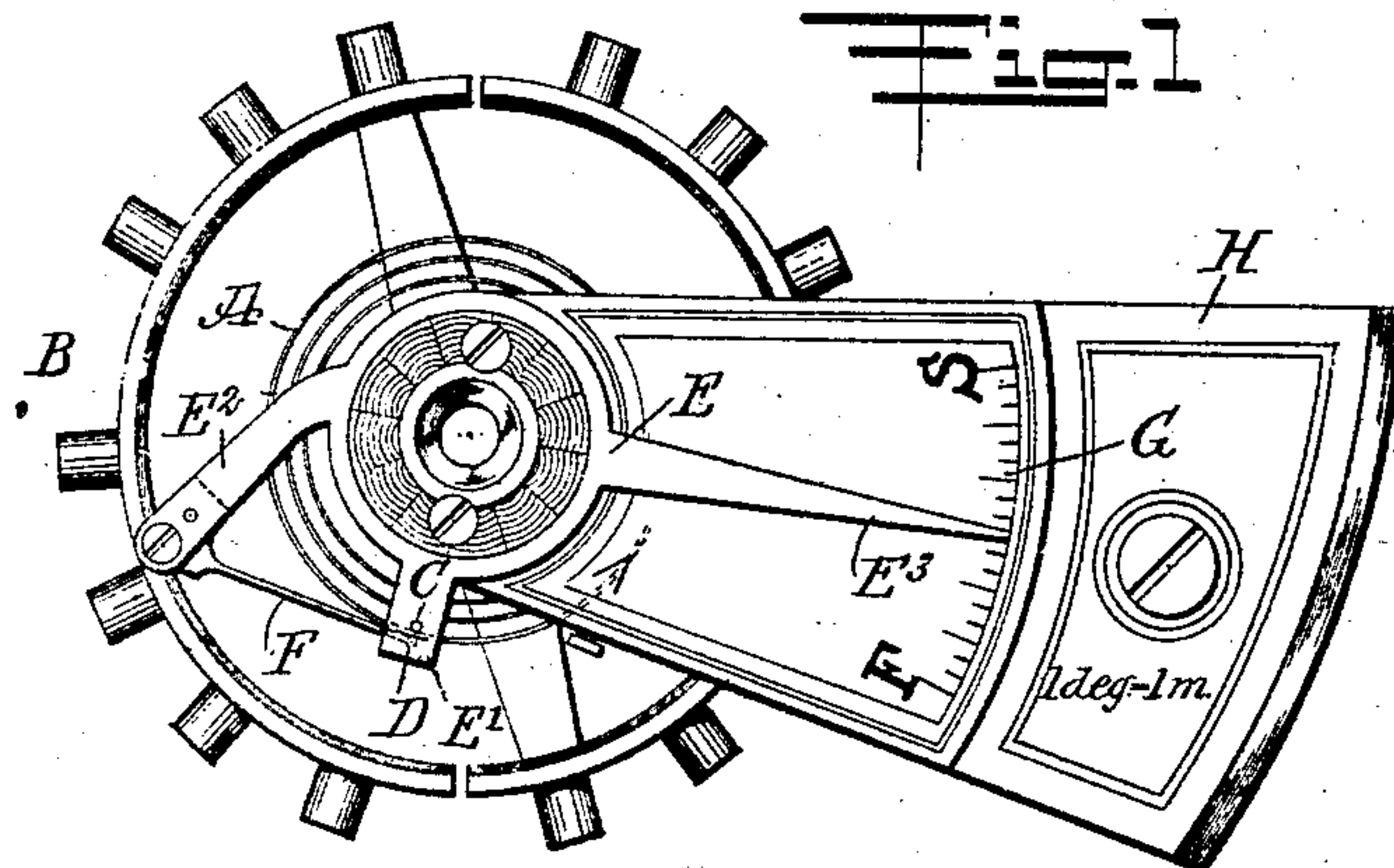


R. G. NORTON.
TIMEPIECE REGULATOR.
APPLICATION FILED JUNE 11, 1907.

907,521.

Patented Dec. 22, 1908.



WITNESSES
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RICHARD GREENLEAF NORTON, OF MADISON, WISCONSIN.

TIMEPIECE-REGULATOR.

No. 907,521.

Specification of Letters Patent.

Patented Dec. 22, 1908.

Application filed June 11, 1907. Serial No. 378,367.

To all whom it may concern:

Be it known that I, RICHARD GREENLEAF NORTON, a citizen of the United States, and a resident of Madison, in the county of Dane and State of Wisconsin, have invented a new and Improved Timepiece-Regulator, of which the following is a full, clear, and exact description.

The invention relates to chronometers, watches and like time-pieces, and its object is to provide a new and improved regulator, arranged to permit easy and accurate adjustment of the hair spring of the balance, with a view to accurately regulate the vibrations of the balance of the time-piece.

The invention consists of novel features and parts and combinations of the same, which will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is an enlarged plan view of the improvement as applied; Fig. 2 is a side elevation of the same, and Fig. 3 is an inverted sectional plan view of the same on the line 3—3 of Fig. 2.

In regulators for time-pieces as now constructed, the curb pins of the regulator lever are fixed and the distance between the curb pins exceeds somewhat the thickness of the hair spring of the balance, so that the curb pins loosely embrace the hair spring, to allow of shifting the curb pins along the hair spring when regulating the time-piece. Now it is evident that as the hair spring loosely extends between the curb pins, that portion of the hair spring which is between the curb pins hammers more or less against either or both of the curb pins when the balance vibrates. If the hair spring bears only on one of the curb pins and the regulator lever is shifted to either fast or slow, it may not touch either of the curb pins, and hence when the regulator lever is shifted for faster or slower the time-piece may run either slow, fast or still slower. In case the curb pins are accidentally set too close together to firmly embrace or bind the hair spring, then the latter buckles on shifting the regulator lever. It is also well known that the rate of the time-piece is changed by the slightest change of position of the time-piece from pendent

vertical to pendent horizontal or otherwise, owing to the wind of the hair spring (coil) resting more or less on one or the other of the curb pins, thereby changing the rate of the time-piece. In order to overcome these and other errors and defects, the following arrangement is made: The hair spring A of the balance B is clampingly embraced between the curb pins C and D, of which the curb pin C is fixed to the arm E' of the regulator lever E, while the other curb pin D is secured to the free end of a spring F attached to an arm E² of the regulator lever E, the arm E² being spaced from the arm E', as plainly indicated in the drawings. The spring F presses the curb pin D against the outer side of the hair spring A, thus pressing the inner side of the hair spring against the curb pin C, that is, the hair spring A is clampingly embraced between the fixed curb pin C and the spring-pressed curb pin D. The arm E³ of the regulator lever E indicates on a graduation G, arranged on the bracket H for supporting the balance. When it is desired to adjust the time-piece, the operator shifts the regulator lever E to the desired position, that is, one, two or more degrees on the graduation G.

From the foregoing it will be seen that the regulating of the balance is so positive that a constant value of one division or degree on the graduation G is reduced to a formula which is marked on the bracket H (see Fig. 1), and by the use of this formula the watchmaker or other person can readily adjust the balance lever E, to cause an accurate running of the time-piece, in a comparatively short time. Thus, if a time-piece varies one minute in a given time and one division or degree represents one minute variation, it is only necessary for the operator to shift the regulating lever E from one division or degree to the next following, or towards fast or slow, as the case may be.

As is well known ships' chronometers have no regulators in the sense to which they are applied to watches, but the regulator described and shown in the drawings can be readily applied to chronometers and thereby avoids the tedious process of bringing such chronometers to time by the mean-time screws now applied to the chronometer balance.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A regulator for time-pieces, comprising a movable regulator lever provided with spaced rigid arms, a fixed curb pin secured to one of the said arms, and a spring secured to
5 the other arm and having its free end extending opposite the fixed curb pin and then bent approximately at right angles to form a second curb pin operating in conjunction with the fixed curb pin to clamp the hair
10 spring.

2. A regulator for time-pieces, comprising a movable regulator lever provided with spaced rigid arms, a fixed curb pin secured to one of the said arms, a spring secured at one
15 end to the other arm and provided at its free end with a curb pin operating in conjunction with the fixed curb pin to clamp the hair spring, and a graduation on which indicates

the said lever, the marks on the graduation having a fixed and indicated value. 20

3. A regulator for time-pieces comprising a movable regulator lever provided with spaced arms, a fixed curb pin secured to one arm, a spring attached to the other arm, and a clamping curb pin attached to the said
25 spring and operating in conjunction with the said fixed curb pin to clamp the hair spring between the said curb pins.

In testimony whereof I have signed my name to this specification in the presence of
30 two subscribing witnesses.

RICHARD GREENLEAF NORTON.

Witnesses:

CHARLES N. BROWN,
ELSIE KARBERG.