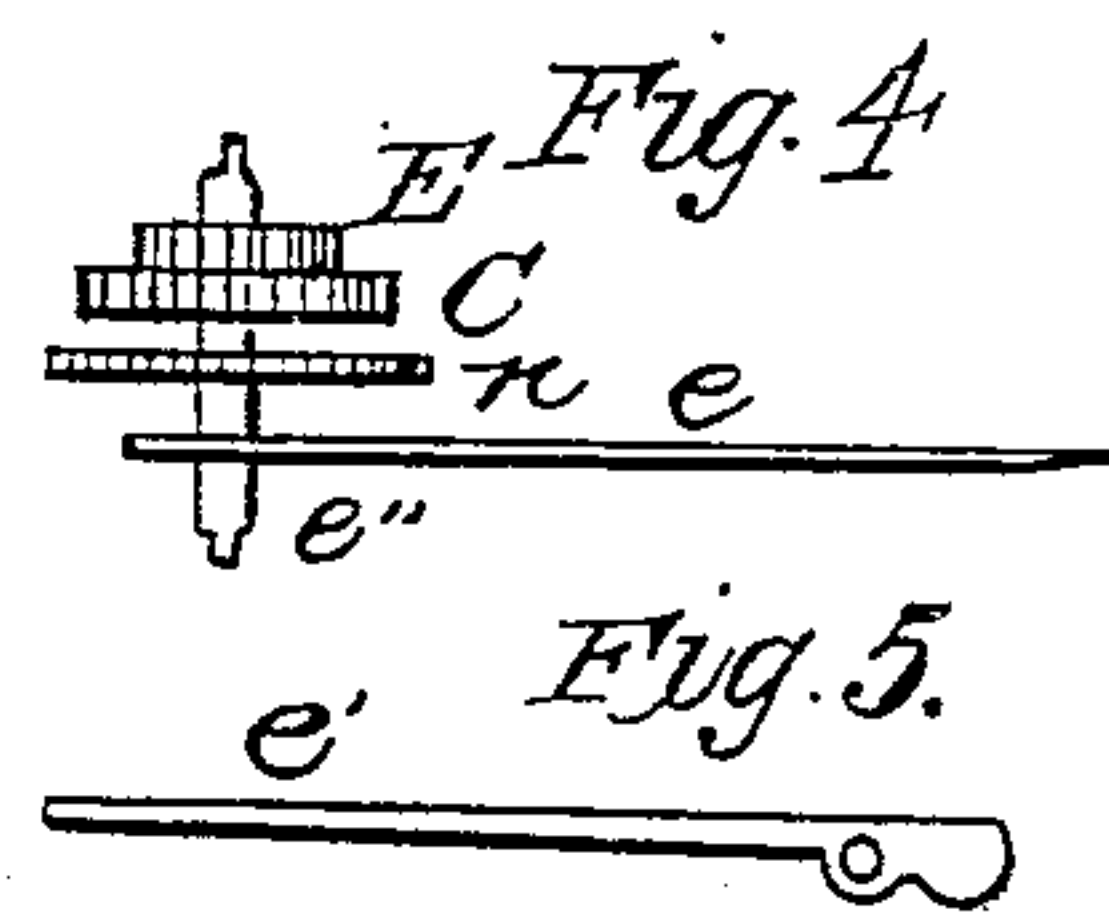
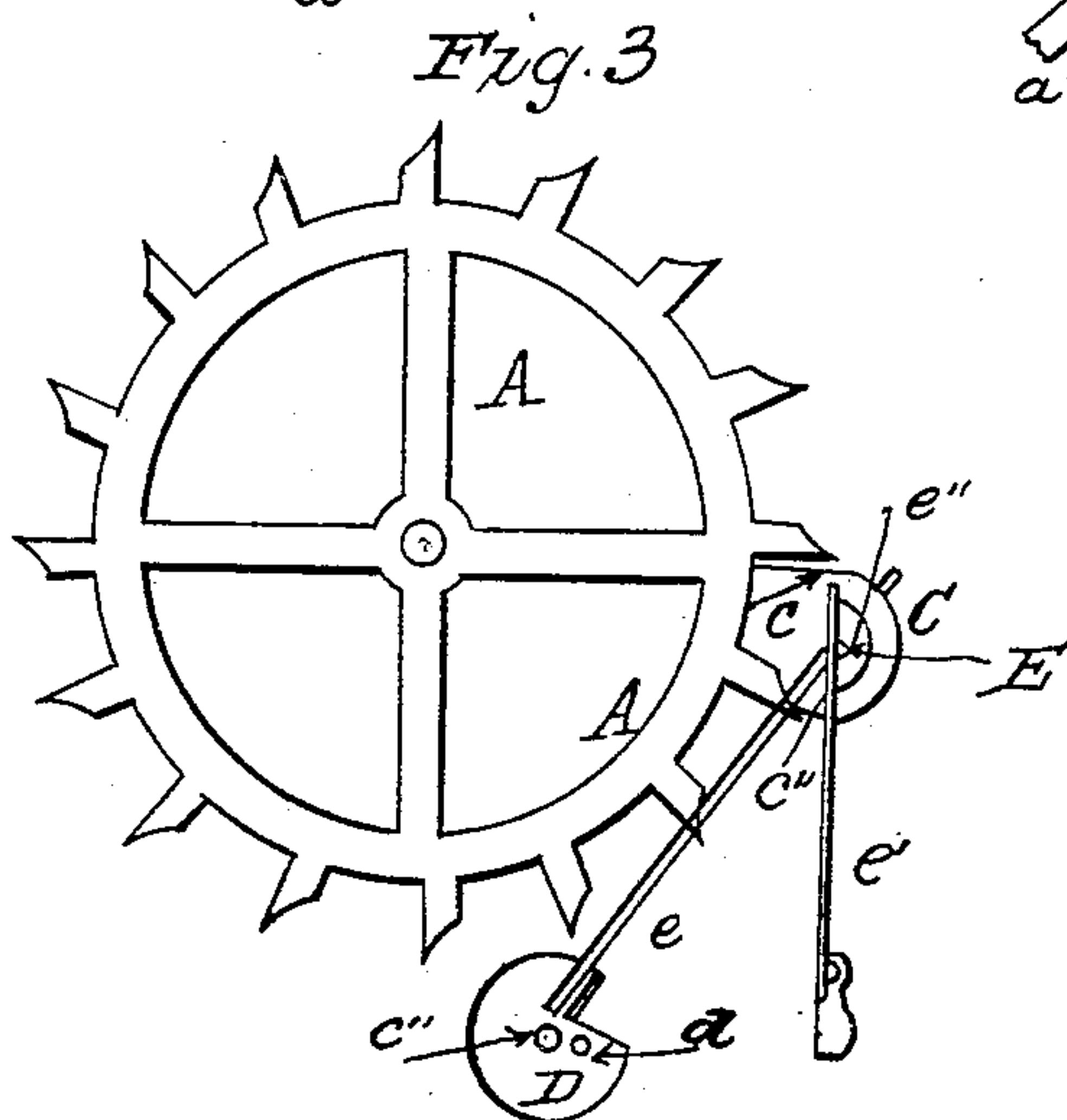
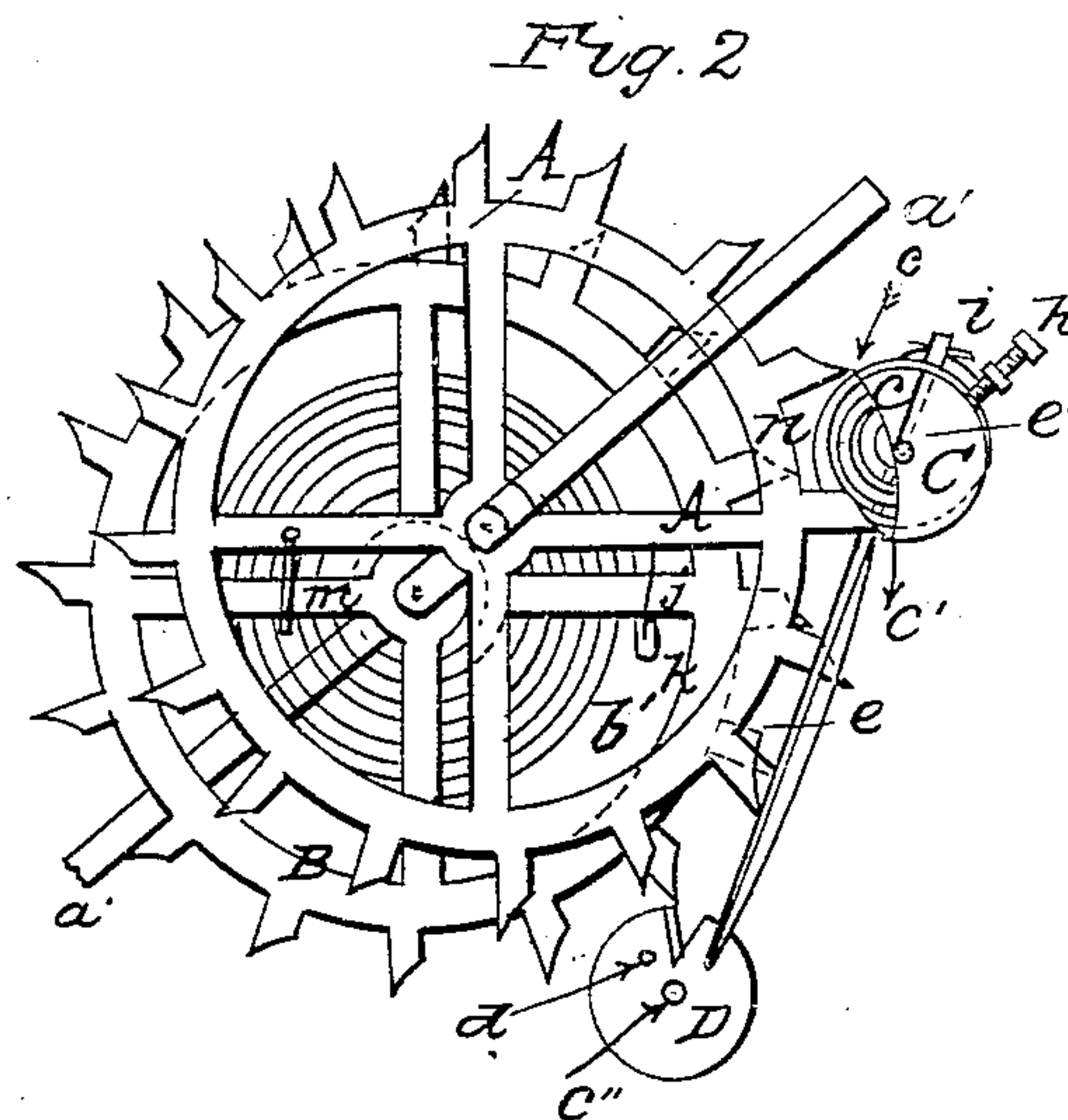
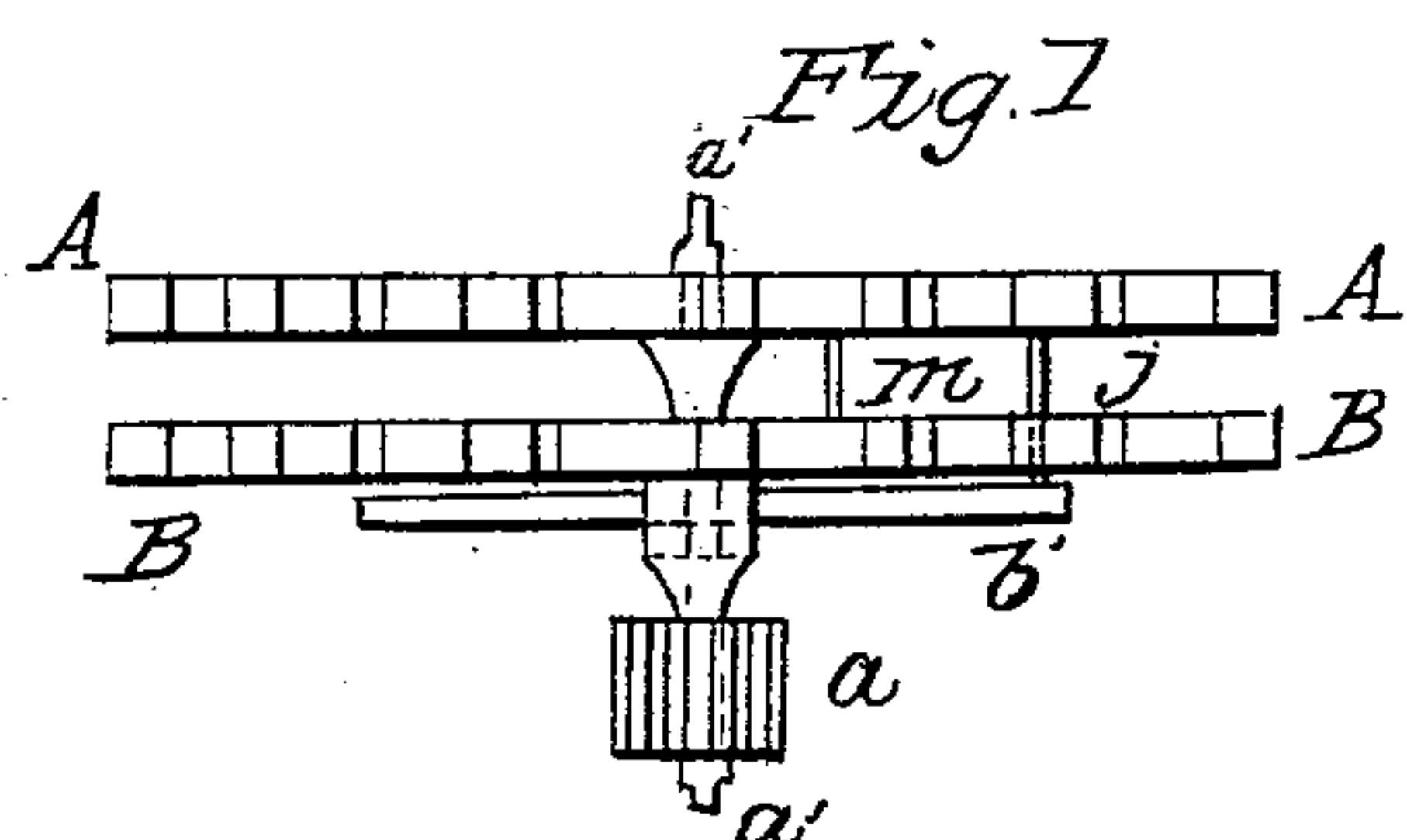


L. BILLON.  
Watch Escapement.

No. 51,414.

Patented Dec. 12, 1865.



Witnesses  
Theodore Long  
Geo. Johnson

Inventor  
Louis. Billon  
by his Attorney  
S. S. Fahnstock

# UNITED STATES PATENT OFFICE.

LOUIS BILLON, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN WATCH-ESCAPEMENTS.

Specification forming part of Letters Patent No. **51,414**, dated December 12, 1865; antedated August 28, 1865.

*To all whom it may concern:*

Be it known that I, LOUIS BILLON, of the city of Brooklyn, in the county of Kings, in the State of New York, have invented a new and useful Improvement in Escapements for Watches, Clocks, Regulators, Chronometers, or any other kind of Time-Pieces, and which I call "Billon's constant-force escapement;" and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in so arranging two escapement-wheels on the same arbor, one being tight and the other loose, and combining these with a rest-piece and a table-roller that the motive power has no direct influence at all on the impulse which the balance receives from the wheel of escapement, because the wheel which gives said impulse to the balance gets its power only by means of its spiral spring, the other wheel fixed to the arbor serving only to rest against the rest-piece. This wheel has two places of rest, the first on the upper part, the second on the lower part of rest-piece, where the tooth of escapement-wheel rests during the impulsion which the escapement-wheel of constant force gives to the table-roller of balance-staff.

In the drawings, Figure 1 represents an elevation of the two wheels of escapement on same arbor; also, the spiral spring below attached to lower wheel at its inner end and at its outer end connected with upper wheel. Below this is the usual pinion-wheel. Fig. 2 is a perspective view of the wheels, showing their connection with cylinder or rest-piece and with table-roller or balance-staff. Fig. 3 shows the upper escapement-wheel in a different position than in Fig. 1. Fig. 4 shows in elevation the cylinder or resting piece and the transverse arm passing through its arbor.

Other detached parts in drawings will be referred to hereinafter.

It is unnecessary to describe the several parts of an ordinary watch, its gearing, &c., by which motive power is communicated to escapement-staff through its pinion-wheel, as this is well known to all skilled in the art.

*a* represents the pinion-wheel on lower end of escapement-wheel arbor. On this arbor, *a'*,

are two escapement-wheels, A and B, first and second, or upper and lower, looking at the watch from its back. The upper one, A, is fastened to arbor *a'*, and its teeth engage with cylinder or rest-piece C, having two rests, *c* and *c'*. The lower wheel, B, is loose on the arbor *a'*, has a limited motion of rotation regulated by spring *b'* and its connection with upper wheel. This spiral spring is fastened to the center of wheel B by a small ferrule, (split,) and connects with the wheel A by a hook, *k*, at its outer end, which hooks over a pin, *f*, projecting from wheel A. Both these wheels have the same number of teeth, and those of B engage with the table-roller D of balance-staff *e''*. The balance, its spring, and staff are not shown in the drawings, in order to expose the roller D below. Alongside of *e''* a small pin, *d*, projects from the table-roller parallel to staff, and it engages arm *e*, unlocking the rest-piece C.

In Fig. 2 a spiral spring, *n*, is shown under rest-piece C, to bring it back after its unlocking by means of pin *d* and arm *e*; but a straight spring, *e'*, may be used, as shown in Figs. 3 and 5, in which case a suitable bearing-piece, such as seen by E, Fig. 3, would have to be attached to arbor *e''* for end of said spring to rest against and be out of the way of passing teeth.

The relative position of the two wheels A and B may be reversed, if desired.

In Fig. 2 *h* represents a regulating or set screw for the spiral spring, operating with rest-piece C, and *i* is a stud to which the outer end is fastened, the inner being attached to a collar on arbor *e''*.

From one of the arms of the upper wheel a pin, *j*, drops down between the arms of the lower wheel, B, and the outer end of spring *b'* hooks around it. This spring being slightly wound up, it carries the lower wheel around by its connection with the upper one through pin *j*. An arm of the lower wheel stops against a pin, *m*, which drops from an arm of the upper wheel, so that it does not pass the teeth of the resting-wheel after having given its impulse to the balance.

In Fig. 2 the wheel A, which is fastened to the arbor, is represented as having escaped its first rest, with the tooth against the second rest or notch, and the position of the wheel B of constant force represents the beginning of its



impulsion at the table-roller of the balance as it gives its impulsion after the other or rest wheel has escaped.

In Fig. 3 the tooth of wheel A is represented as stopped on its first rest.

If the balance-spring be removed, the balance, instead of having a vibratory or reciprocating motion, it will have a continuous motion of rotation, and can be made to keep good time for clocks, watches, &c. By giving the power to the constant-force wheel the motion of rotation can be increased or decreased at will by winding up the spring of the constant wheel-force or by lessening the force.

A delicate spring, *y*, may be placed alongside of transverse arm *e* for pin *d* to strike against, instead of *e*, making the movement of unlocking the rest still more delicate of my constant-force escapement. Time-pieces working a long time without stopping can be more perfectly regulated.

When the teeth of wheel A escape from rest *c* to rest or notch *c'*, where it is detained for the moment, the lower wheel, B, gives impulsion to

the table-roller of balance-staff. This wheel B has the constant power of the hair-spring *b*, which is wound up each motion of pinion-wheel or its staff and wheel A. The force of this wheel B can be increased by winding the hair-spring, or it can be decreased at will.

When a tooth of the lower wheel is up to the table-roller a small brass pin on it comes in contact with the small arm or pin and light spring, passing through arbor of cylinder or rest-piece, and permits a tooth of upper wheel to pass from its first to its second rest on said piece.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

The combination of the cylinder or rest-piece C, the wheels A and B, and table-roller D, constructed and operating substantially as described, for the purpose set forth.

LOUIS BILLON.

Witnesses:

THEODORE LANG,  
F. A. KUFFER.