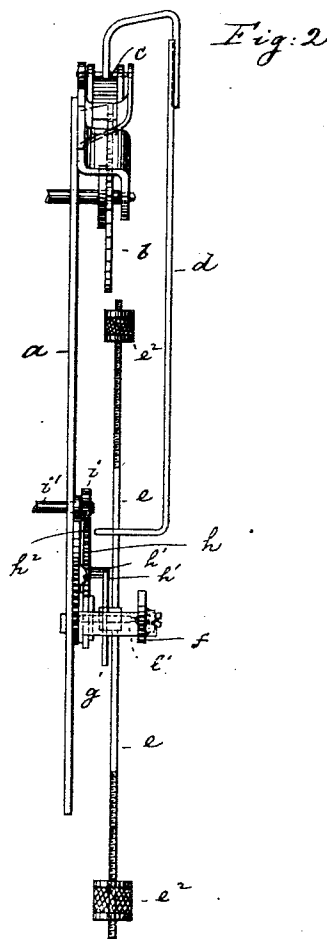
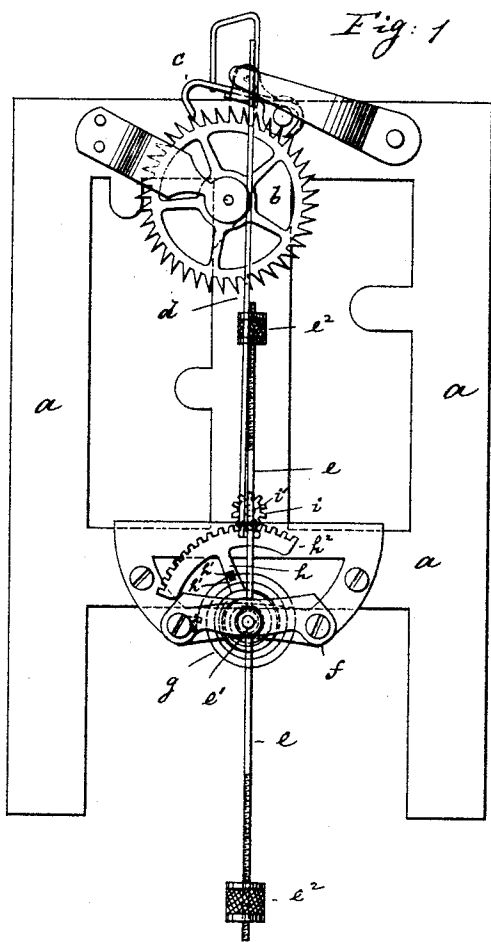


(No Model.)

O. BARTEL.
CLOCK PENDULUM.

No. 515,856.

Patented Mar. 6, 1894.



Witnesses:
J. J. Goughmans.
W. Schulz

Inventor:
Otto Bartel
by his attorneys
Rolder & Brierley

UNITED STATES PATENT OFFICE.

OTTO BARTEL, OF NEW YORK, N. Y.

CLOCK-PENDULUM.

SPECIFICATION forming part of Letters Patent No. 515,856, dated March 6, 1894.

Application filed July 12, 1893. Serial No. 480,205. (No model.)

To all whom it may concern:

Be it known that I, OTTO BARTEL, of New York city, New York, have invented an Improved Pendulum Clock, of which the following is a specification.

This invention relates to a pendulum clock which is so constructed that it may be carried about without taking the pendulum off, while at the same time it admits of the most delicate adjustment.

In the accompanying drawings: Figure 1 is a rear elevation of my improved pendulum clock. Fig. 2 is a longitudinal central section thereof.

The letter *a*, represents the frame of the clock movement.

b, is the escape wheel, *c*, the verge or anchor and *d*, the crutch wire attached to the verge and operating the pendulum.

e, represents the pendulum rod mounted on staff *e'*, which turns in bearing *f*. The pendulum projects above and below the staff and is threaded at its ends to receive the adjustable weights *e*². By these weights the coarse regulation of the clock is effected. In order to provide for the more delicate regulation, I employ a hair or balance spring *g*, that surrounds the staff *e'*, and is connected thereto at its inner end. The outer end of the spring is engaged by the two pins *h'*, *h'*, of regulating arm *h*, turning on the staff. The arm *h*, is provided with a toothed seg-

ment *h*², engaged by a spur wheel *i*, fast on arbor *i'*, which projects through the dial and may be revolved by a key as usual. By turning the arbor *i'*, the tension of the balance spring is changed in the well known manner.

The advantages connected with my improved pendulum clock, are that it may be carried about without removing the pendulum, as the latter will not break or bend when out of line. At the same time, the clock possesses all the advantages connected with a pendulum clock, *i. e.* it will keep correct time for eight days, as the pendulum will keep up the proper momentum, after the main spring has begun to run down.

What I claim is—

1. The combination, with a swinging rod having its center of gravity below its pivotal point, to act as a pendulum of a balance spring secured to said rod, co-operating with the same, substantially as described.

2. The combination, with a pendulum, of a balance spring connected to and co-operating therewith, means for varying the movement of the pendulum, and means for adjusting the tension of the spring, substantially as described.

OTTO BARTEL.

Witnesses:

H. W. BRUNJES,

W. VON SCHLEPEGRELL.