

S. B. TERRY.
Clock Escapement.

No. 10,277.

Patented Nov. 29, 1853.

Fig. 1.

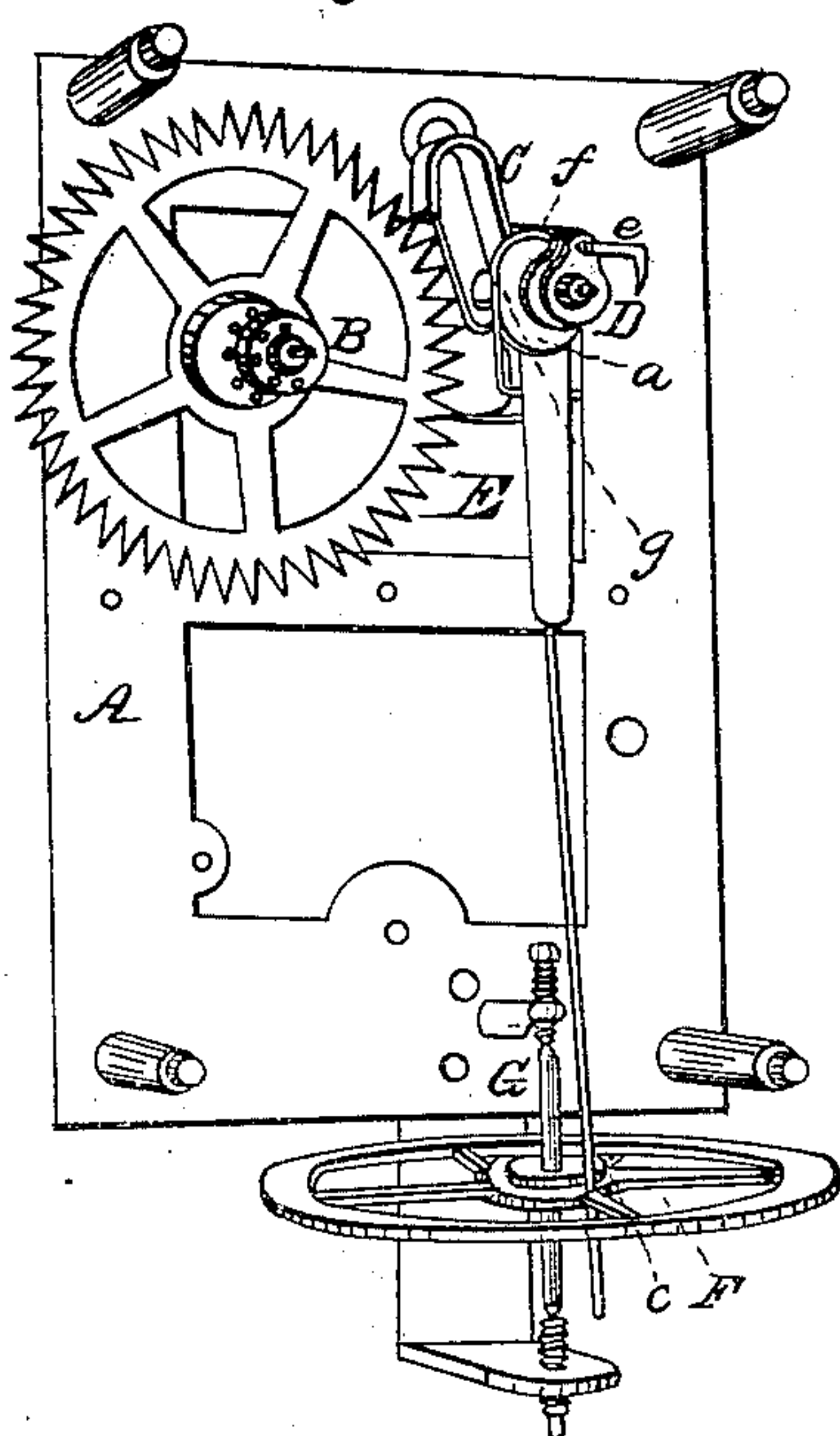


Fig. 2.

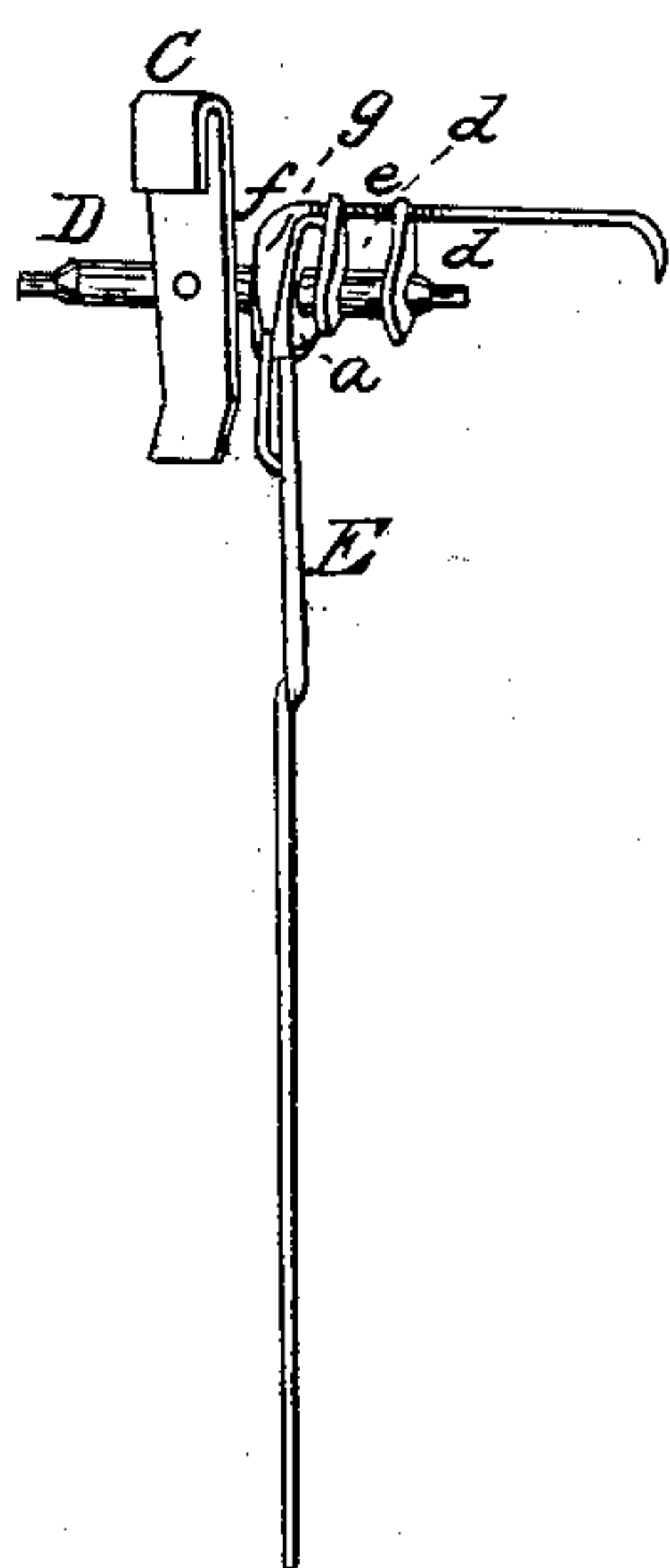


Fig. 3.

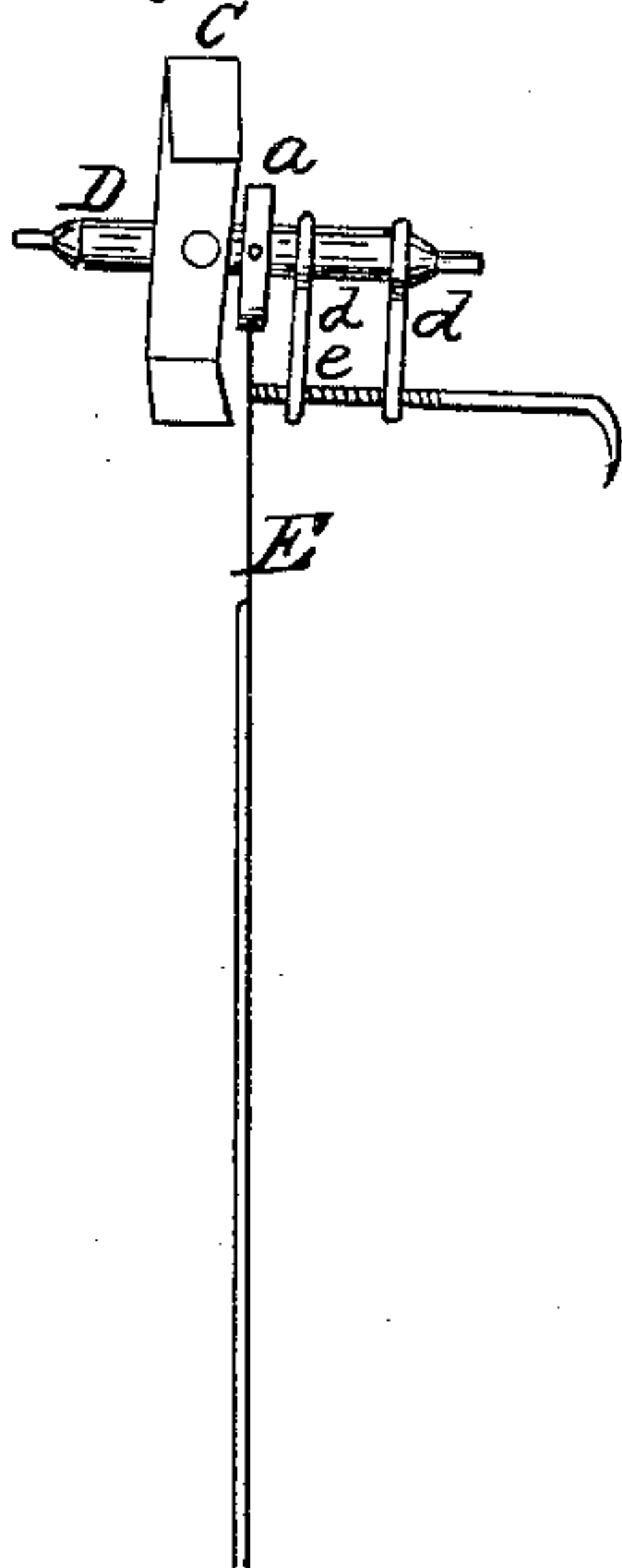
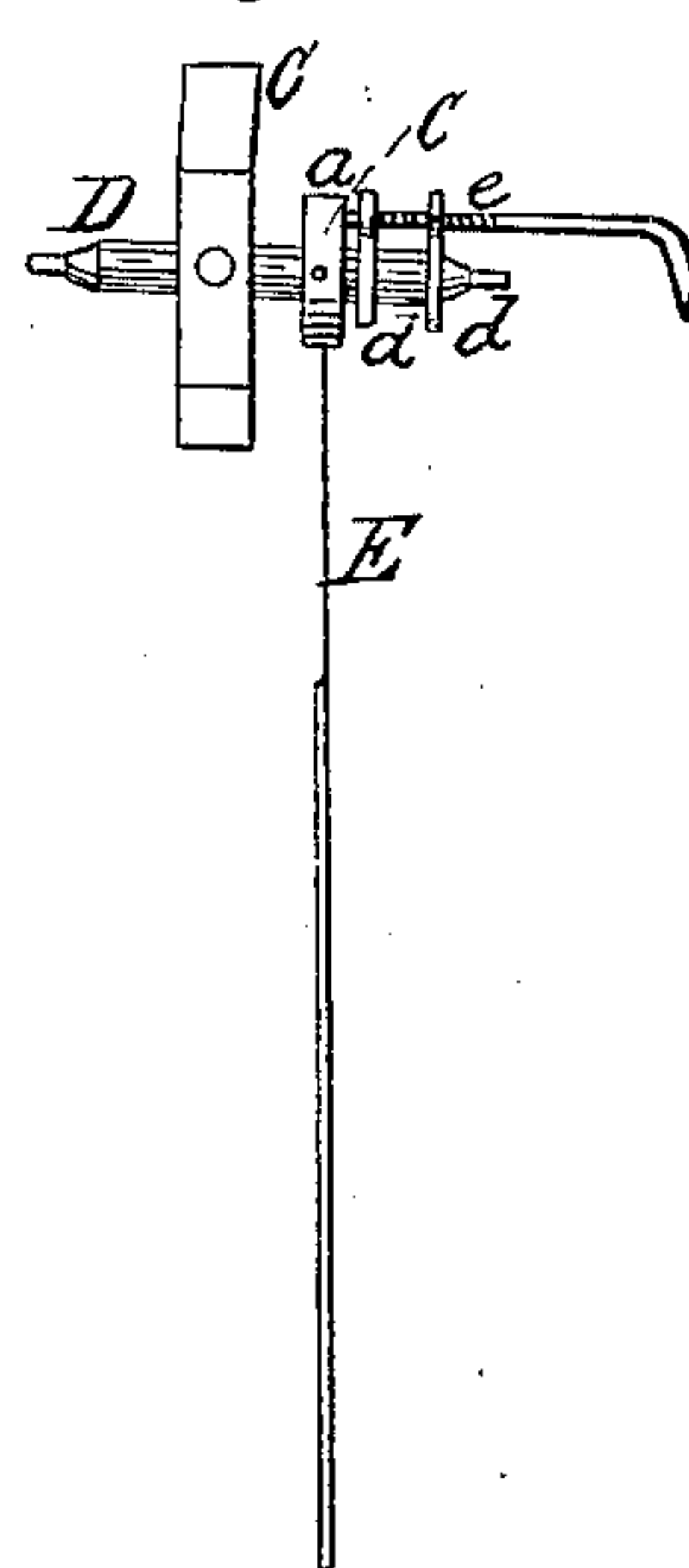


Fig. 4.



UNITED STATES PATENT OFFICE.

SILAS B. TERRY, OF PLYMOUTH, CONNECTICUT.

MODE OF APPLYING THE VIBRATING SPRING OF BALANCE-CLOCKS.

Specification of Letters Patent No. 10,277, dated November 29, 1853.

To all whom it may concern:

Be it known that I, SILAS B. TERRY, of Terryville, Plymouth, in the county of Litchfield and State of Connecticut, have
5 invented certain new and useful Improvements in Timepieces; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings,
10 forming part of this specification, in which—

Figure 1, is an isometrical view of the escapement and balance of a marine clock constructed according to my improvements.
15 Figs. 2, 3, and 4, are side views of slightly differing forms of the verge and crutch wire and spring.

Similar letters of reference indicate corresponding parts in each of the several
20 figures.

This invention is more particularly applicable to what is termed the "marine clock," but is also applicable to all timepieces whose movement is governed by a
25 balance.

It consists, first, in making what is, termed the "fork or crutch wire" a flat and elastic spring at, and near the end where it is attached to the verge or verge
30 arbor, the opposite end being made small and round to enter a hole perforated in the arm of the balance wheel, or in a collet on the balance arbor, or spindle. This arbor, or spindle, is placed at right angles to the
35 verge arbor and in a line with the crutch or fork where it is attached to the verge arbor. The spring part of the crutch should be made of sufficient strength to produce the oscillations, or vibrations, of the
40 balance, when set in motion by the motive power of the clock, in about such time as may be desired.

It consists, secondly, in regulating the force of the crutch spring, by increasing or
45 lessening its tension, in a manner substantially as follows: 1st, by means of a screw which passes through female screws in two cams or projections made fast to the verge arbor, and which terminates on the crutch
50 spring at a point near where it is fastened to the verge arbor. 2d, by means of a screw passing, in a similar manner, through cams on the opposite side of the verge arbor, and terminating upon a wire, which passes
55 partly around the circumference of the collet by which the crutch spring is fastened

to the verge arbor, and thence, at a little distance from the collet, comes in contact with the crutch spring on the side opposite the screw, and is hung to the collet by pins
60 which permit it to move in such a direction that the pressure of the screw will produce a strain upon the crutch spring. 3d, the collet by which the crutch spring is attached to the verge arbor, may be hung to it by a
65 pin passing diametrically through both the collet and verge arbor, at right angles to the crutch wire, and the screw instead of terminating upon the wire, as in the last instance, may terminate upon the collet and
70 by its pressure, strain the spring on the opposite side of the verge arbor.

To enable those skilled in the art, to make use of this invention, the following description of its peculiarities is given, with
75 references to the drawings hereto attached.

A, (Fig. 1,) represents the back plate of the clock; B, the escapement wheel; C, the verge; D, the verge arbor, none of which differs essentially from those in common
80 use.

E is the crutch spring, attached to the verge shaft by means of the collet *a*. This in Figs. 2, and 3, is attached firmly to the verge shaft. In Fig. 4, it is hung by the
85 pin *b*, which passes through the diameter of the verge shaft at right angles to the crutch spring, and allows a free motion to the crutch spring in a plane at right angles to the axis of the pin *b*. The crutch spring
90 E is made of steel or other elastic metal flattened at the part near where it is fastened to the verge shaft and rounded at the other end where it enters the hole *c* in an arm of the balance F or in a collet attached
95 to its arbor. It is similar in form to the crutch of the "torsion spring clock" for which Letters Patent No. 9310, were issued to me on the 5th day of October A. D. 1852. It was there patented simply as a means of
100 transmitting the motive power of the clock to the balance, and here, as taking the place of the torsion, or common hair spring in producing the vibrations of the balance.

The balance F is similar to the common
105 balance, but its spindle G, is hung in a position at right angles to the verge arbor, and in a line with the crutch spring where it is attached to the verge arbor.

d, d, are cams made fast to the verge
110 shaft, in each of which are female screws which admit the regulator screw *e*. This

screw may as in Fig. 2, terminate upon the wire *f* which is flattened where it passes partly around the circumference of the collet *a* to which it is hung by the pins *g*, *h*, and comes in contact with the crutch spring E on the side opposite to the screw; or as in Fig. 3 it may terminate directly upon the crutch spring E; or as in Fig. 4, upon the collet *a*. In either case, its effect will be, to produce more or less strain upon the crutch spring and thus, increase or lessen the vibrations of the balance. The end of the screw opposite to the one already described may pass through the dial plate and there receive a hand, or pointer, the requisite direction of whose motions may be indicated by letters upon the dial. It will be seen that the crutch spring moves upon a center which is in a line with the axis of the balance. Hence, the point *c*, where the crutch wire enters the balance is always equally distant from the center of motion of the crutch spring, whatever be the position of the balance wheel when properly hung; so that there is no endwise motion of the wire in the hole *c* and the friction that is attendant upon the common lever escapement, is obviated.

The above described mode of applying the crutch spring to the balance of a time-

piece does not admit of a wide range of variation in the arc of vibration, without too great a change of rate, but by trial, the arc can be so adjusted in length as to be very nearly isochronal, *i. e.*, so that small changes in its length of vibration will not make a material change of rate.

The improvement here set forth consists in the cheapness of construction of the escapement as compared with the lever escapement and hair spring; as the parts which transmit the motive power of the clock to the balance, and govern its vibrations, are here combined in one, and the ordinary hair spring is dispensed with; likewise there is less friction than in the lever escapement, as the impulse imparted by the lever to the balance is in a direct line with the motion of the balance.

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

The making the crutch spring E perform the office of the common hair spring in producing the vibrations of the balance, substantially in the manner herein set forth.

SILAS B. TERRY.

Witnesses:

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AMMI GIDDINGS.