S. B. TERRY.

Marine Clock.

No. 9,310. Patented Oct. 5, 1852.

Fig. 3.

Fig. 2.

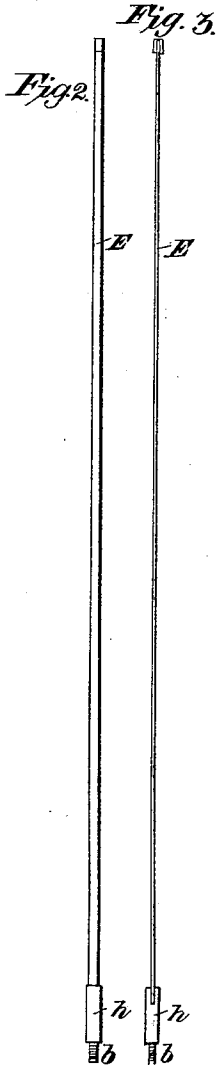


Fig. 1.

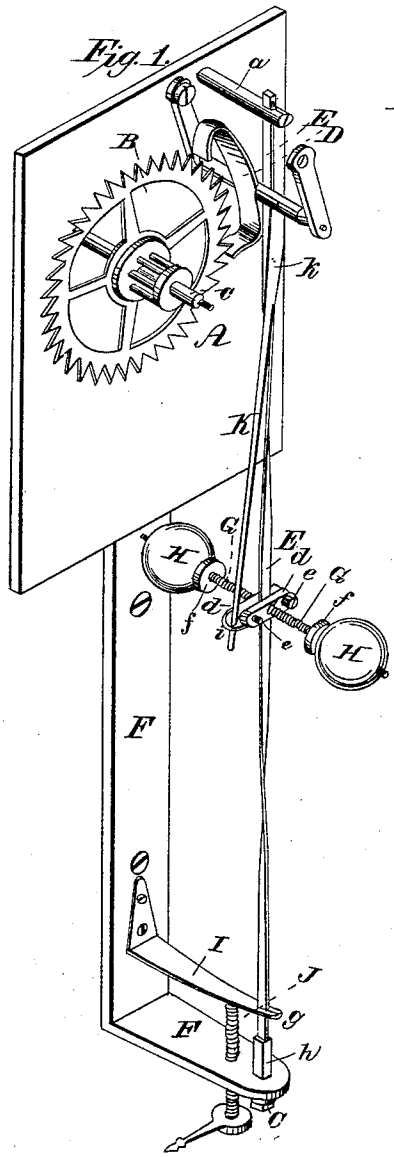
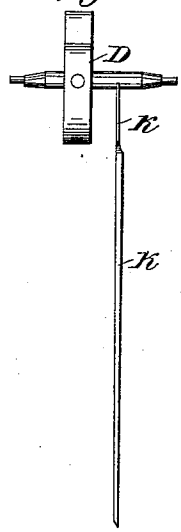


Fig. 4.
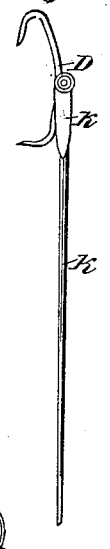


Fig. 5.



N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

SILAS B. TERRY, OF PLYMOUTH, CONNECTICUT.

TIMEPIECE.

Specification of Letters Patent No. 9,310, dated October 5, 1852.

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 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, 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. Fig. 2, is a side view of the spring on which the balance is hung, detached from the other parts; Fig. 3, is an edge or front view of the same. Fig. 4, is a front view of the verge and crutch wire, or fork; and Fig. 5, is a side view of the same.

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

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

It consists—first, in substituting for the spindle of the balance a straight thin flat spring of steel or other metal secured at its ends so that they cannot turn or otherwise move from their position. The balance is fastened to this spring at about the middle of its length and the spring must be of sufficient length to allow of its twisting by the vibration of the balance, the said twisting being regulated by increasing or decreasing the tension of the spring. The object of thus hanging the balance is to avoid the friction of the pivots of the ordinary balance which soon fret and chafe by use and require to be often oiled, at the same time that this is accomplished the ordinary hair spring is dispensed with.

It consists—secondly in making what is termed the "fork" or "crutch wire," which transmits the motion from the verge to the balance, flat and very thin, or furnishing it with a hinge or joint so as to be capable of bending or turning with ease in a direction at right angles to the motion of the pallets of the verge at the part where it is fastened to the verge or verge arbor, from which it extends in line with the axis of the balance; and fitting its point or end into a hole in a collet attached to the balance whereby it gives motion to the balance, it will move in the same direction as the balance, and obviate the excessive friction produced by the common lever whose motion is at right angles to the arbor of the balance.

To enable those skilled in the art to make and use my invention I will proceed to describe fully its construction and operation.

A, (Fig. 1) represents the back plate of the clock, B, the escapement wheel; C, its arbor, D, the verge; none of which differ from the corresponding parts of other time pieces.

E, is the spring on which the balance is hung, which I prefer to be of steel very thin and not very wide. It is placed in a vertical position its upper end being secured to a fixed arm *a*, at its lower end it has a square guide piece *h*, attached, which fits easily in a square hole in a stationary bracket F, attached below the guide piece there is a screw *b*, (see Figs. 2, and 3,) to which is fitted a nut *c*, (see Fig. 1) which bears against the under side of the bracket F. By this nut any degree of tension can be given to the spring. The spring is so arranged that when it is at rest there is no twist in it.

G, G, are the arms of the balance which are screwed along the whole or part of their length, and are attached to clamps *d*, *d*, which are furnished with screws *e*, *e*, by which they are firmly secured to the spring E.

H, H, are the balance weights which are screwed to fit the arms and can be adjusted at any required point on them, and secured in place by set nuts *f*, *f*.

I, is a slide for lengthening and shortening the acting part of the spring E, or the part that is twisted by the vibrations of the balance, consisting of a metal arm secured to the bracket F, or to any suitable support, and having a slit *g*, in its front end which fits to the spring E, and prevents it twisting at the point where it holds it. The arm is capable of being bent or sprung so as to hold the spring E, at a point nearer or farther from the balance, by means of a screw J, which works in a female screw in the bracket F. One of these slides may be used near each end of the spring but I think one is sufficient.

By lengthening and shortening the acting part of the balance spring E the balance is regulated to go faster or slower, faster when it is shortened and slower when lengthened.

The same object may be accomplished by increasing the tension on the spring through the nut *c*, and screw *b*, but I prefer only to use that to adjust the tension to the degree considered most desirable in the first instance and to use the slide I, as the regulator. A pointer is attached to the screw J, by which to turn it, and there may be a dial to which the pointer will serve as an indicator.

K, is the crutch wire which consists of a long straight wire attached one end to the verge arbor and having its other end fitting to a hole in a collet *i*, which is secured to one of the clamps *d*, *d;* it is flattened out very thin at the part where it connects with the verge and for some distance below it. It will be seen that the end of the wire which fits into the collet must move in an arc of a circle or in the same direction as the motion of the balance—this it could not do unless the wire were allowed to bend and if the wire were round throughout it would not bend without the application of more force than is applied by the verge. The thinness of the part *k*, allows it to bend, while its strength edgewise, which is in the direction in which its power is applied is sufficient to give the impulse to the balance.

It may be well to observe that the spring E, may be used to carry the balance, irrespective of the manner in which the motion is given to the balance. The motion may be given by an escapement similar to that of the "patent lever watches," or in many other ways. It will be seen that there is no friction whatever produced by the spring E, and therefore no wear, and no necessity for oiling to keep it in order. The spring when twisted has always a tendency to spring back to its flat state; this tendency is increased by the momentum of the balance, which makes it twist in the opposite direction producing the same effect as the hair spring of the common balance. In addition to the absence of friction in the balance, which will prevent its ever wearing out; my improvement possesses the advantages of being more simple and more cheaply constructed as the axis and hair spring are combined.

The arrangement of giving motion to the balance produces an amount of friction so slight as to be almost imperceptible, that in the hole in the collet *i*, being all; but this is a mere nothing as the wire scarcely moves within it. It possesses two advantages over the common lever, viz: that its friction is less, and it can be used with either a dead beat or recoil escapement. The same effect as is produced by flattening the fork, or crutch wire may be produced by making a hinge or joint in it; but I consider the flattening preferable for the sake of cheapness of construction; at the same time as I consider the hinge or joint to be equivalent, I do not wish to confine myself to the flattening.

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

1. Hanging the balance of a clock, or timepiece on a spring or strip of metal E which is fixed or prevented from turning at both of its ends but capable of twisting between the ends substantially as and for the purpose herein described.

2. Making one part of the fork or crutch wire K, flat and thin substantially as shown at *k*, or otherwise constructing it to allow it to bend or move in a similar manner, and connecting the said fork or crutch wire with the balance in any manner as shown at *i*, which causes it to give its impulse in the same direction as the motion of the balance, the said bending or motion of the fork or crutch being for the purpose of allowing it to transmit the impulse in the above direction.

SILAS B. TERRY.

Witnesses:
O. D. MUNN,
E. C. POLHAMUS.