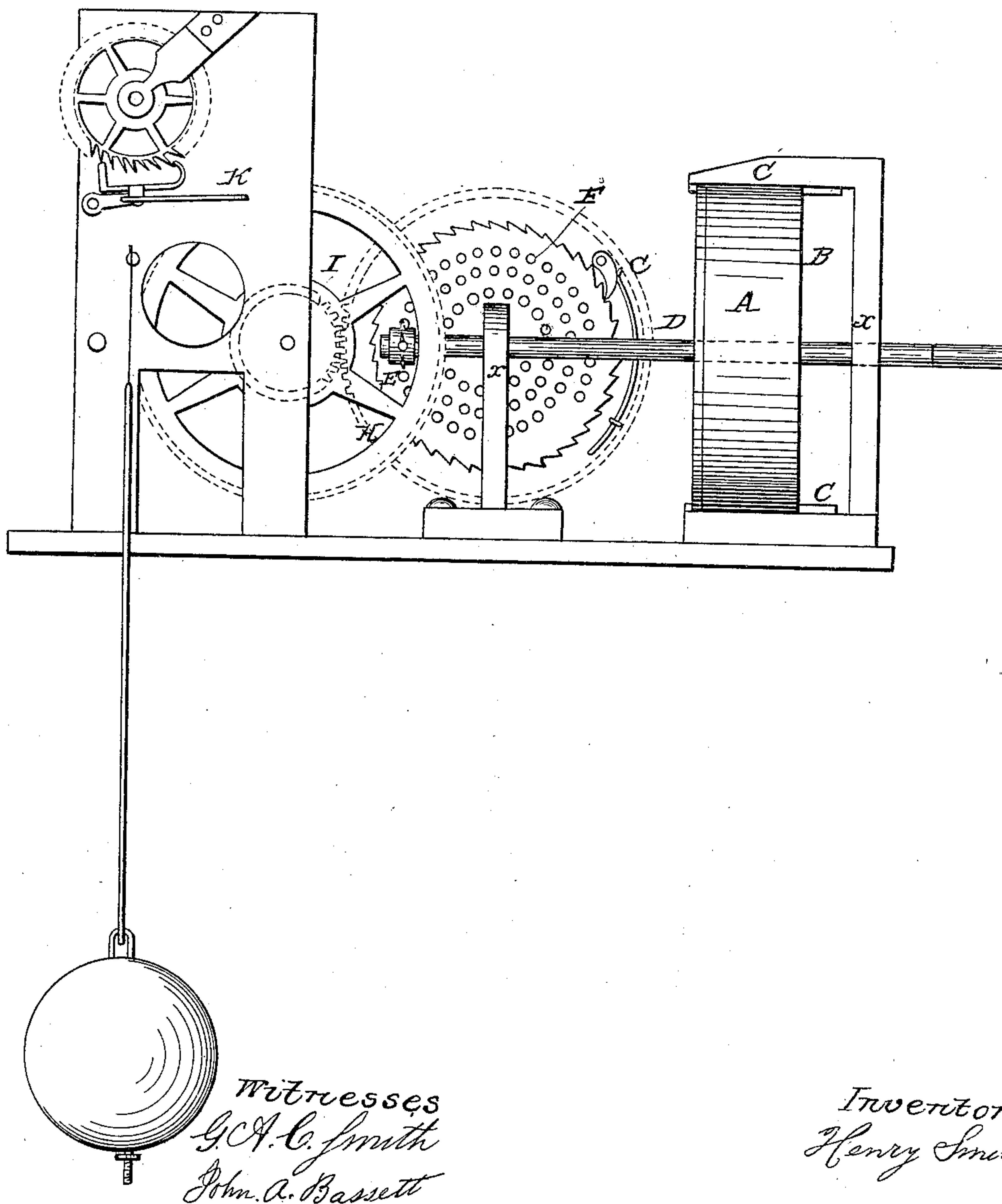


H. SMITH.
Clock Movement.

No. 59,668.

Patented Nov. 13, 1866.



UNITED STATES PATENT OFFICE.

GILES K. COATES, OF BOSTON, MASSACHUSETTS, ADMINISTRATOR OF
HENRY SMITH, DECEASED.

IMPROVEMENT IN EQUALIZING-SPRINGS FOR CLOCK-MOVEMENTS.

Specification forming part of Letters Patent No. 59,668, dated November 13, 1866.

To all whom it may concern:

Be it known that I, HENRY SMITH, of Salem, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Clock-Movements; and I do hereby declare that the following is a full, clear, and exact description of the same, with reference to the drawings forming a part of this specification—

Figure 1 of which represents an elevation.

Similar letters of reference indicate like parts in all the figures.

The object of this invention is to combine an equalized coiled spring with a clock-movement in such a manner that, the uniform tension of the spring being preserved, there will always be the same power exerted upon the wheel-work of the clock.

On the 30th of January, 1866, I secured Letters Patent for an improved mechanical movement, in which it is shown that the power of a coiled spring may be controlled during its unwinding by means of a scroll-rack or volute-toothed gear and pinion; and the nature of this invention is to combine this movement with the wheel-work of a clock or watch, and thereby obtain many advantages over the ordinary unbalanced spring.

It is well known to those skilled in the art that there are many difficulties in the use of the ordinary spring as applied to a clock-movement. It is required to be made much stronger than is necessary, for there must be a surplus power to drive the clock with any degree of uniformity. This extra power, without fully accomplishing the desired object, causes the movement to wear out much faster, and the works must be made much stronger than would be required if the spring were of the exact power to drive the movement uniformly through the whole of its uncoiling.

The construction and operation of my invention may be described as follows:

The spring A is placed in the case B, which slides in the grooves C C, to accommodate the motion of the pinion over the scroll-rack. The spring is placed on the shaft D, which has a pinion, E, fixed on one end. The pinion E engages with the scroll-rack F. The shaft D is supported in the bearings *x x*.

The scroll-rack F has a ratchet and pawl,

G, which connects its motion with the gear-wheel H, so that the spring may be wound up independent of and without reversing the clock-movement. The gear-wheel H meshes with the small wheel or pinion I, which forms a part of the whole clock-movement K.

In the movement of the pinion E over the face of the scroll or volute gear F, it will be seen that when the spring is wound up the pinion is nearest the center of the scroll-rack, and that as it unwinds the pinion gradually moves out toward the circumference, following the scroll described by the convolute gear, its leverage upon the scroll-rack being least when the spring is wound up, and gradually increasing as it uncoils, so that as the power is transferred to the scroll-rack it forms a perfect balance to the varying degrees of tension of the spring.

A clock constructed with this movement, if the parts are properly made, is certain to keep correct time.

In the drawing shown, an ordinary clock-movement is used, and the parts spread out, so as to show clearly the application of this principle; but the scroll-rack may be placed on the main wheel, and a more compact arrangement secured.

The spring may also be placed on the shaft with the scroll-rack operating with it, and accomplishing the same result.

It is also obvious that the train of the clock-movement may be simplified, and a less number of wheels and corresponding parts used.

A much smaller spring may be used, and the whole arrangement is durable and not liable to get out of order.

I find in the practical working of my invention that it is desirable to place the shaft on which the pinion is fixed a little on one side of the center of the scroll-rack. By doing this the line of the openings coincides more perfectly with the teeth of the pinion.

The spring may be secured to the shaft by means of a feather or spline in such a manner that the shaft will have the same lateral motion while the spring remains stationary; or the pinion may be made to slide on the shaft over the face of the scroll-rack by means of a spline or feather, while the shaft will have no lateral motion.

There are various methods of applying this movement without varying the nature of my invention or the result produced. I have selected that which seems most clearly to illustrate the principles involved.

Having thus fully described the nature of my invention, what I claim as new, and desire to secure by Letters Patent, is—

The combination, with a clock or watch move-

ment, of a coiled spring the power of which is equalized by a scroll-rack and movable pinion, substantially in the manner and for the purpose described.

HENRY SMITH.

Witnesses:

JOHN A. BASSETT,
O. C. SMITH.