C. M. C. PRENTICE.

Compensation Pendulum.

No. 164,210. Patented June 8, 1875.

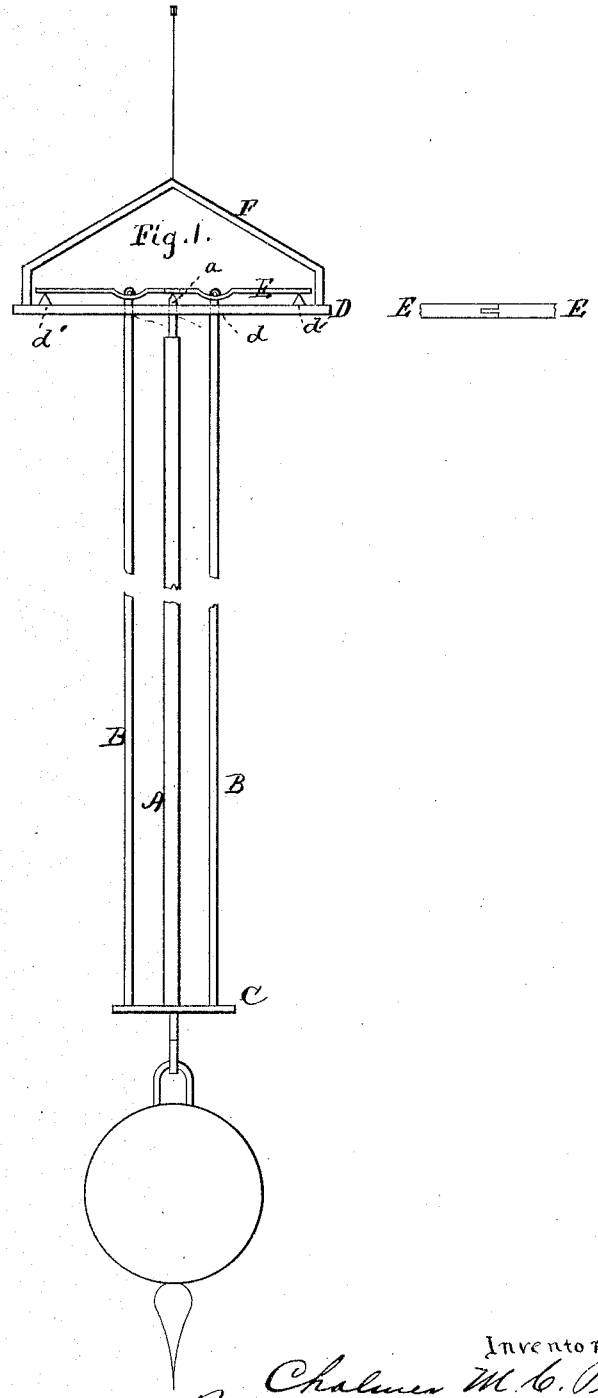

Fig. 1.

Witnesses

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UNITED STATES PATENT OFFICE.

CHALMER M. C. PRENTICE, OF MONROEVILLE, OHIO.

IMPROVEMENT IN COMPENSATION-PENDULUMS.

Specification forming part of Letters Patent No. **164,210**, dated June 8, 1875; application filed March 13, 1875.

To all whom it may concern:

Be it known that I, CHALMER M. C. PRENTICE, of Monroeville, in the county of Huron and State of Ohio, have invented certain new and useful Improvements in Compensation-Pendulum; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in compensation-pendulums; and consists in a tilting leverage so connected with the upper extremities of the vertical rods of a pendulum, one or more of which rods are formed of a metal varying in its expansion and contraction from the metal of which the remaining rod or rods are formed, that a constant and invariable distance is maintained between the centers of suspension and oscillation of the pendulum, notwithstanding any change in the temperature to which it may be subjected.

Referring to the drawings, Figure 1 is my device, where two levers and three rods are employed.

It will be seen that modifications can be indefinitely extended without exceeding the principle of my invention.

A and B are parallel rods, A being of a more expansive metal than B, the rods B same in diameter and length, and the rods A and B are all rigidly attached to a lower cross-plate, C, while their upper extremities pass without friction through the slot *d* in the upper cross-plate D. The upper end of B engages with the lever E, which has as its fulcrum the little upright *d'* on D, and as its point of application of power the upper end *a* of rod A. F is any suitable frame-work supporting the foregoing, which may be connected with the interior works of a clock in any suitable manner.

The bob may be attached to either the cross-plate C or rod A.

The operation of this mechanism is as follows: In an expansion consequent upon a rise in temperature, the rod B has a tendency to downward elongation, while the rod A, possessing a higher coefficient of expansion, has a tendency to upward elongation in proportion as this coefficient exceeds that of the rod B, and thus proportionately raises said rod B by means of lever E. Contrariwise, in a contraction attendant upon a fall in temperature, the rod A shortens more than the rod B, and necessarily causes the long arm of the lever E to fall and lower the rod B.

Thus a change of temperature develops two forces in the pendulum, one tending to lengthen and the other to shorten it, so connected with lever E that their resultant is zero, and the pendulum remains unchanged in its length.

This result is attained by properly selecting the metals to be used in the pendulum with reference to their relative linear expansion and contraction, and calculating the distance which should intervene between the rods A and B on the lever E, so that the difference in their contraction or expansion may, by means of said lever E, exactly counteract one another's tendency to shorten or lengthen the pendulum, thus preserving its isochronous oscillations through all temperatures.

I am aware that the feature of varying metallic expansion has long been used in compensation-pendulums; but I do not know of this device of a tilting leverage at the upper extremities of the rods A and B ever having been used in connection therewith.

It is not absolutely essential that two rods of one kind and one of the other be employed, as shown; but there may be but one of each, or there may be two or more of each, so that there is a corresponding lever for each downwardly-expanding rod.

What I claim as new is—

1. A compensating-pendulum consisting of a series of metallic rods, B, each rod suspended from a point between the fulcrum and point of application of the power of a lever, E, and secured rigidly to a plate, C, at their lower ends, in combination with one or more rods, A, possessing a greater degree of expansion, the said rod A being connected with plate C at bottom, and acting as a power for the lever E, substantially as and for the purpose described.

2. The combination, with plates C and D and levers E on the upper plate, of rod or rods A and rod or rods B, the said rod or rods A, by their greater expansive properties, acting to raise the levers E, and thus preserve the pendulum constant in length, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHALMER M. C. PRENTICE.

Witnesses:

FRANCIS TOUMEY,

THOMAS B. HALL.