No. 751,686. PATENTED FEB. 9, 1904.

H. SATTLER.

COMPENSATION PENDULUM.

APPLICATION FILED MAR. 16, 1903.

NO MODEL.

Fig. 1

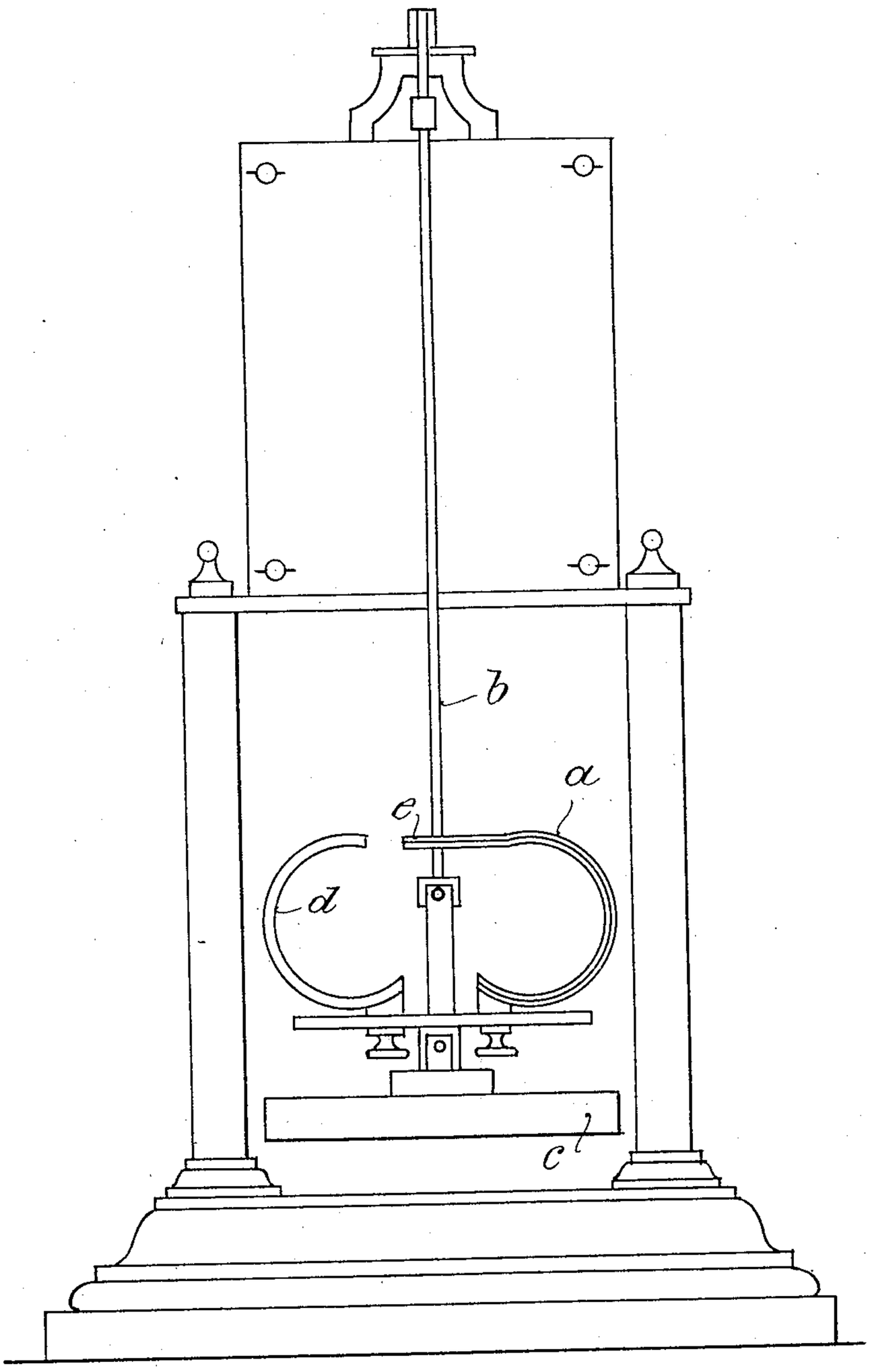

Fig. 2.

Witnesses:

Inventor.
Heinrich Sattler
by Wright Brown & Quinby
his attorney.

No. 751,686. Patented February 9, 1904.

UNITED STATES PATENT OFFICE.

HEINRICH SATTLER, OF MUNICH, GERMANY, ASSIGNOR TO THE FIRM OF ANDREAS HUBER, OF MUNICH, GERMANY.

COMPENSATION-PENDULUM.

SPECIFICATION forming part of Letters Patent No. 751,686, dated February 9, 1904.

Application filed March 16, 1903. Serial No. 147,960. (No model.)

To all whom it may concern:

Be it known that I, HEINRICH SATTLER, a citizen of Germany, residing at Munich, Bavaria, Germany, have invented certain new and useful Improvements in Compensating Pendulums; 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 appertains to make and use the same.

The present invention relates to means for compensating pendulums, and more particularly to that class of pendulums known as "rotary" pendulums, in which the weight is suspended from a thin flat spring and oscillates in a vertical plane by the torsion of the spring. In order to compensate a pendulum of this class when changes of temperature occur, it is necessary to reduce or enlarge the length of the torsional part of the suspending-spring, and thus to correspondingly reduce or enlarge the swing or rotary reciprocation of the weight. This is effected according to the present invention by providing a compound metal strip which expands under different temperatures and embraces with its end the torsional spring at different points of its length, so that the said spring will be varied in its effective length according to the existing temperature.

In order to render the present specification easily intelligible, reference is had to the accompanying drawings, in which similar letters of reference denote similar parts throughout both views.

Figure 1 is a front elevation of the pendulum; and Fig. 2 is a plan view in section through the pendulum-spring, showing the forked end of the compound metal bar embracing the spring.

It is well known that if a compound bar consisting of two suitable sorts of metals combined along their length is subjected to variations of temperature it will be more or less bent—such, for instance, as a bar of zinc and a bar of steel joined together along their length—or combination of many other sorts of metal will act in the same way.

In the drawings, *b* is the flat spring, to the lower end of which the weight *c* is attached. This weight is reciprocated backward and forward around its center owing to the torsion of the spring *b*. Attached to the weight *c* or to a plate fixed to the same is the bent strip of compound metal *a*, which is bifurcated at its upper free end, as at *e*, and embraces the flat spring *b* loosely, but not sufficiently loosely to allow the spring to turn in its bifurcation.

On a change of temperature the bent strip *a* will be moved so that its forked end will either be moved higher up the spring *b* or lower down the same. This movement of the forked end of the strip will determine the length of the spring which will be subjected to the torsion, and thus the length of the spring will be varied according to changes in the temperature, and the pendulum will be accurately compensated.

The strip *a* might be mounted at the top of the spring *b* instead of at the bottom, and it need not necessarily be bent. It might be straight; but when bent it takes up less room in the clock-casing. The bow *d* is merely provided in the embodiment of the invention illustrated to counterbalance the weight of the strip *a*.

I claim as my invention—

1. The combination with a pendulum suspended by a torsional spring, of a compound strip of different metals having unequal susceptibility to changes of temperature, said strip having one end fixed in a suitable manner and its other end bifurcated and embracing the torsional spring of the pendulum.

2. A device for compensation-pendulums of the class specified, consisting of a strip of metals of two different sorts joined along their length, said strip having one end forked to embrace the flat spring of the pendulum and being bent round and having its opposite end fixed to the weight of the pendulum.

3. The combination, with a pendulum adapted to oscillate about its axis, of a strip formed of two metals which are unequally susceptible to expansion and contraction under changes of temperature, said strip mounted upon a

suitable support and embracing the pendulum in such manner as to control its effective length.

4. The combination, with a pendulum suspended by a torsional spring and adapted to oscillate about its axis under the influence of said torsional spring, of a strip formed of two metals of unequal susceptibility to changes of temperature, said strip mounted upon the pendulum and oscillating therewith and its free end embracing the torsional spring and controlling the effective length thereof.

5. The combination, with a pendulum suspended by a torsional spring and adapted to oscillate about the axis of said spring, of a bent strip composed of longitudinally-united metals of unequal susceptibility to expansion and contraction under changes of temperature, the said strip secured at one end to the pendulum in such manner as to oscillate therewith, the other end embracing by a bifurcated portion the torsional spring in such manner as to vary its effective length under diverse temperatures, and a compensating weight upon the opposite side of the pendulum.

In testimony whereof I affix my signature in presence of two witnesses.

HEINRICH SATTLER.

Witnesses:

CLARA I. PARKER,

WALTER E. BOWMAN.