No. 631,103. Patented Aug. 15, 1899.

A. BOREL.

COMPENSATION WATCH BALANCE.

(Application filed Mar. 3, 1899.)

(No Model.)

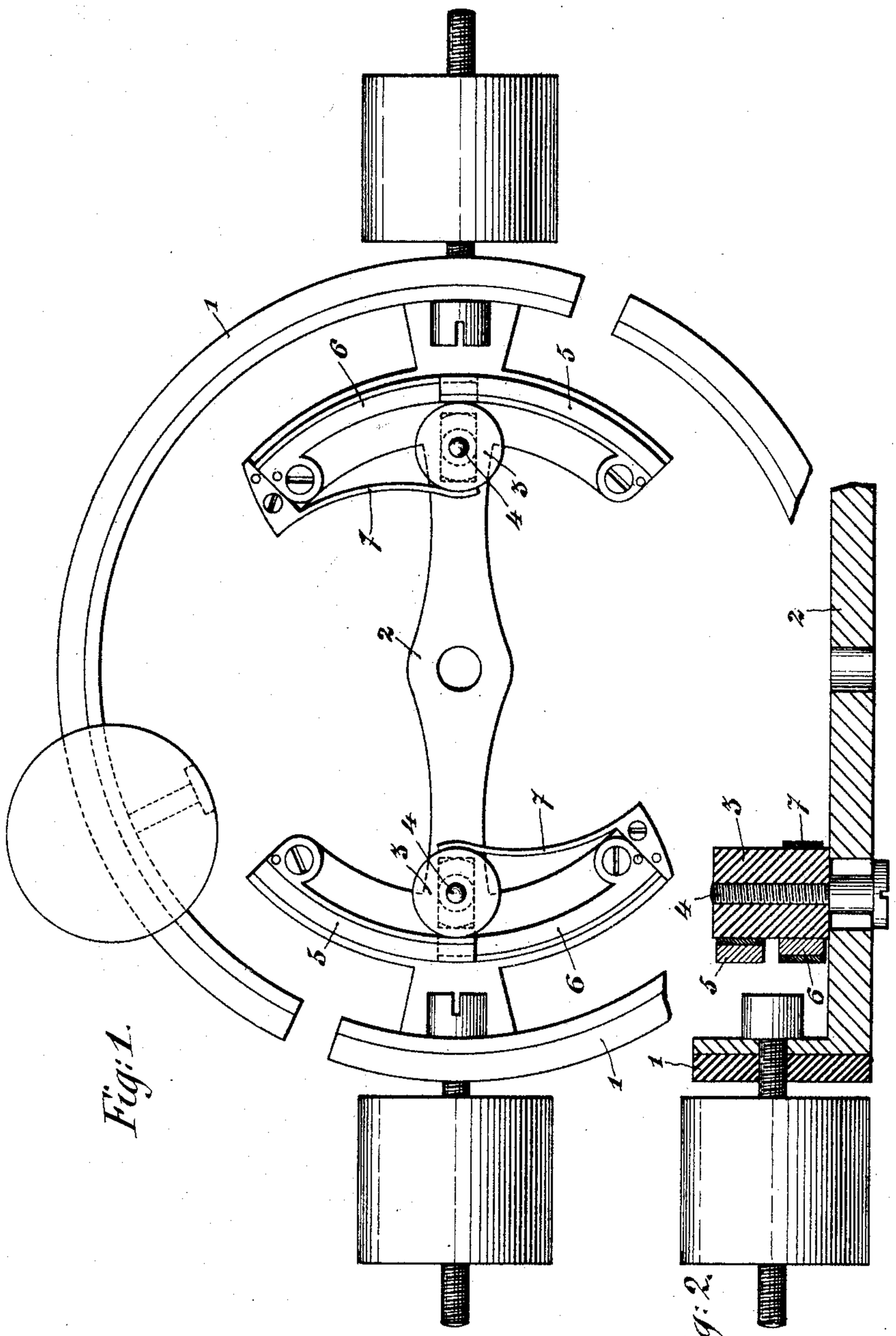

Fig. 1.

Fig. 2.

WITNESSES:

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COMPENSATION WATCH-BALANCE.

SPECIFICATION forming part of Letters Patent No. 631,103, dated August 15, 1899.

Application filed March 3, 1899. Serial No. 707,565. (No model.)

To all whom it may concern:

Be it known that I, ANTOINE BOREL, watchmaker, a citizen of the Republic of Switzerland, residing at Geneva, Switzerland, have invented certain new and useful Improvements in and Relating to Compensation Devices for Chronometer-Watches, of which the following is a specification.

It is a well-known fact that in any chronometer-watch the escapement of which is duly compensated for middle-temperature differences a retarding action of some seconds is caused by the extreme temperatures to which the watch may be accidentally exposed. This fact has already been observed by the well-known English watchmaker Dent in the year 1833, and the said difference bears, therefore, the name of "Dent's anomaly." The purpose of the present invention is to eliminate as far as possible the said Dent's anomaly in chronometer-watches, and this is obtained by means of compensation acting upon the balance-wheel of the watch-escapement.

In the drawings, Figure 1 is a plan view, and Fig. 2 is a cross-section, of the device.

1 is a compensated balance-wheel, the arms 2 of which are provided with two movable weights 3, which are connected to the said arms by means of suitable screws 4, passing through longitudinal slots made in the said arms, so as to allow the said weights to move radially to or from the axis of the balance-wheel. In proximity of the said weights 3 the arms 2 are provided with suitable lateral projections, upon which are fixed two bimetallic blades 5 and 6, the free ends of which are placed one over the other and in the path of the weight 3, which is pressed against the said free ends of the bimetallic blades 5 and 6 by means of a spring 7, fixed to the balance-wheel arm 2. The bimetallic blades 5 and 6 are made to work in inverse sense upon the respective weight 3—that is to say, if the blade 5 has, for instance, its steel portion placed inward and its brass portion placed outward the blade 6 will have its steel portion placed outward and its brass portion placed inward. Now if a very high temperature acts upon the watch the blade 5 will be bent inwardly toward the axis of the balance-wheel and remove the weight 3 in the same direction, which will cause a slight advance of the watch. During this function the blade 6 will remain out of action. If, on the contrary, the watch is submitted to a very low temperature, the bimetallic blade 6 will be bent toward the axis of the balance-wheel and remove the weight 3 in the same direction, which will again cause a slight advance of the watch.

The bimetallic blades 5 and 6 may be made of any other suitable combination of metals whatever; but such combination will always be made so as to have the most dilatable of the two metals forming one of those blades placed inwardly if the most dilatable of the two metals forming the other blade is placed outwardly.

The material of which the pieces 3 are made may vary according to the more or less weight they will have in view of producing the best control of the watch.

Having thus fully described my invention, I claim—

In watches the combination with a compensated balance-wheel of any well-known construction whatever, with radially-movable weights and with pairs of bimetallic blades, each of the said weights being pressed by a suitable spring against the free end of one pair of such bimetallic blades and the metals forming those bimetallic blades being disposed in inverse sense in each pair of such blades so as to have the temperature acting upon the balance-wheel displacing the center of gravity of the said weights by means of causing either the one or the other of the blades of each pair of bimetallic blades to act upon the movable weight bearing against it.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ANTOINE BOREL.

Witnesses:
E. IMER-SCHNEIDER,
TH. IMER.