(No Model.)

W. H. H. BARTON.

SELF REGISTERING THERMOMETER.

No. 289,603. Patented Dec. 4, 1883.

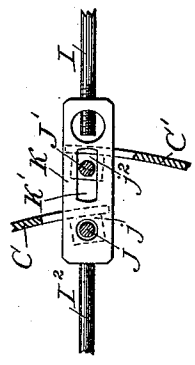


Fig. 3.

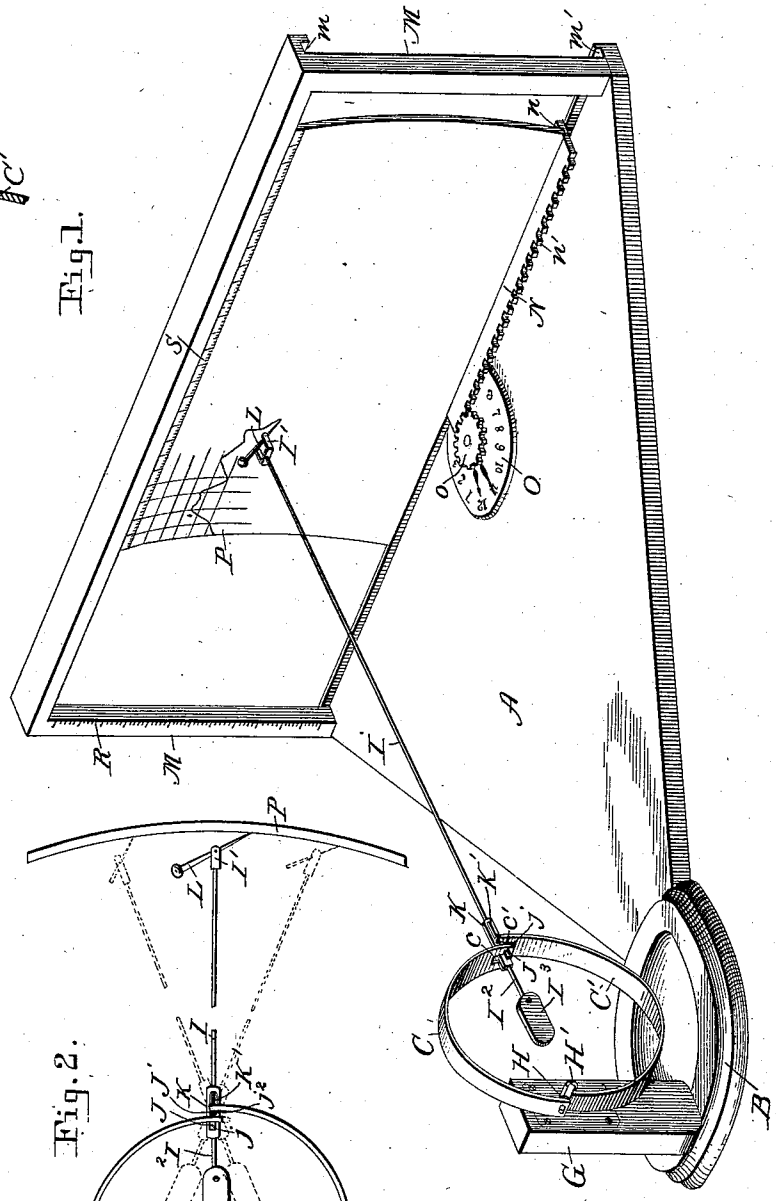


Fig. 1.

Fig. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM H. H. BARTON, OF BROCKTON, MASSACHUSETTS.

SELF-REGISTERING THERMOMETER.

SPECIFICATION forming part of Letters Patent No. 289,603, dated December 4, 1883.

Application filed August 17, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. H. BARTON, a citizen of the United States, residing at Brockton, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Self-Registering Thermometers, of which the following is a specification.

This invention relates to automatic recording-thermometers; and the object of it is to continuously record the various fluctuations in the temperature of the atmosphere and to form a permanent record thereof; and to this end my invention consists in pivoting a long lever or arm directly to the free ends of the bimetallic strips of a metallic thermometer, so that any contraction or expansion of the bimetallic strips incident to the changes in temperature will cause the lever to vibrate. The outer end of the lever is provided with a tracing-needle or other suitable means for indicating or tracing the vibrations on a suitable chart which is supported in an upright frame at a proper distance from the end of the lever, and the chart is moved by a chronometer mechanism across the path of vibrations of the lever.

As illustrating the details and mode of constructing the apparatus for this purpose, reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of my improvement, and Fig. 2 is a side view of the same, the lever-arm being represented in different positions by the dotted lines. Fig. 3 is an enlarged detail view of the joint connecting the strips with the lever.

The base or frame A has at one end a raised circular portion, B, to which is attached an upright post, G. To one side of the post, secured by means of a metallic plate, are two studs or posts, H H'. These studs or posts are close together, one slightly above the other, and project from the upright G at right angles thereto. To these posts or studs H H' are rigidly attached bimetallic strips C C', in the usual manner of constructing thermometers of this kind. In the outer ends of the strips C C' are slats *c c'*, through which the lever I is passed and connected to the metallic strips C C', as will now be described. The lever I is formed of two parts—the outer part, I', to the end of which is pivoted the tracing-needle, and the inner part, I^2, which is provided with a movable weight, I^3. The two parts of the lever I are connected by means of a rectangular bar, K. The bar K passes through the slots *c c'* in the metallic strips C C', and is pivoted to the strip C by means of a pin, J, which is supported or journaled in lugs *j j'* on the inside of the metallic strip C. The bar K is provided with a slot, *k'*. This slot is long and narrow. The strip C' is also provided with lugs j^2 j^3 on the inside, similar to those on the strip C, and through these lugs and the slot *k'* is passed a pin, J'. The lever I being pivoted to the strip C' by means of the pin J, passing through the rectangular bar K, and journaled in the lugs *j j'*, and connected to the strip C' by the pin J', passing through the slot *k'*, the pin J' forms a movable fulcrum, and any contraction of the bimetallic strips C C' forces the outer end of the lever upward and any expansion forces the lever downward.

L is a tracing-needle, which is pivoted at the end of the lever I. The upper end of this needle is preferably weighted, so as to keep its point constantly against the chart and to offset any contraction of the lever-arm, the needle being pivoted so that the weight tends to throw its lower end outward. The needle itself may be weighted, or it may be provided with an adjustable ball.

Instead of the needle L, a pencil or pen may be pivoted in the same manner.

The object of the sliding weight I^3 on the inner end of the lever is to balance the same and to adjust it in relation to a scale hereinafter described.

M is an upright frame, provided with grooves *m m'*.

N is a bar or plate, having a groove, *n*, on its upper side and teeth *n'* on its edge, as shown.

O is a suitable clock-work mechanism, which operates the pinion *o*. The teeth of the pinion *o* mesh with the teeth *n'* of the bar N, and as the shaft on which the pinion is mounted is rotated by the clock-work mechanism motion is thus communicated to the slide or bar N, which is moved across the base of the frame.

Mounted in the groove *n* on the bar N is a suitable chart, P, which may be a smoked-glass plate, a smoked or plain paper chart, or

any other suitable material for receiving the impression made by the tracing needle, pen, or pencil. This chart or glass plate, as the case may be, is slightly concaved on the inner side, in order to be in relatively the same arc of a circle as that described by the vibration of the lever-arm. The upper edge of the chart slides in the groove *m* in the frame. As the chart is rigidly attached to the bar N, it is moved by the clock-work mechanism across the face of the tracing-needle.

Instead of the sliding plate or bar N sliding in the groove *m'* in the frame, it may be mounted upon rollers; or other suitable mechanism for this purpose may be used.

R and S are two scales, which are used to designate the different degrees of temperature and the space over which the chart is moved; but instead of these scales prepared plates or charts having suitable registering-lines may be used.

Having described my invention, its operation is as follows: The lever having been properly adjusted and the clock-work regulated to move the chart at the desired rate of speed, the tracing-needle on the end of the lever bears slightly against the chart, which is so prepared as to be sensitive to the slightest impression. Any contraction or expansion of the bimetallic strips vibrates the lever, and these vibrations are traced upon the chart (which is moved by the clock-work mechanism) by the tracing-needle, which makes a continuous record in diagram form of the temperature at different periods of time. Of course the greater the length of lever used the greater the length of vibration and the more delicate will be the fluctuations recorded.

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

1. The combination of the metallic strips C C', with the lever pivoted to one of said strips and connected to the other strip by means of the pin, and the slotted bar K, so as to have a movable fulcrum, substantially as and for the purpose set forth.

2. An automatic recording-thermometer having a lever pivoted to the metallic strips C C', carrying on its inner end the sliding weight and on its outer end the pivoted needle, pen, or pencil, the inner end and the outer end of the lever being connected by means of a slotted bar, K, substantially as and for the purpose set forth.

3. The combination of the bimetallic plates, slotted as described, the lever pivoted therein, and provided at its outer end with a tracing needle, pen, or pencil, and its inner end with the movable weight, the movable slide or bar N, the concave chart, the clock-work mechanism, pinion O, and the scales R and S, all substantially as and for the purpose set forth.

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

WILLIAM H. H. BARTON.

Witnesses:
IRA A. LEACH,
SIMEON L. MILLARD.