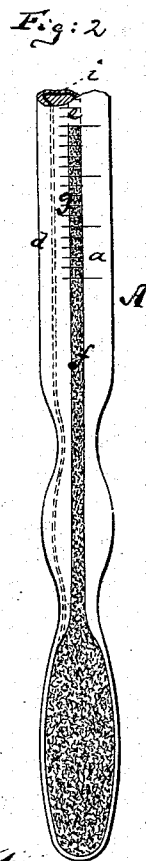
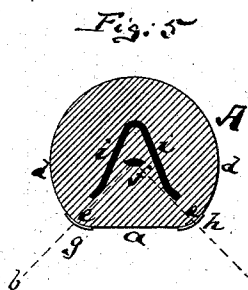
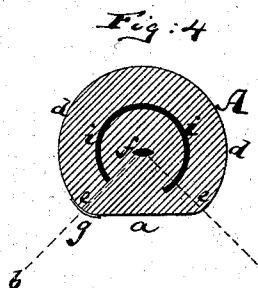
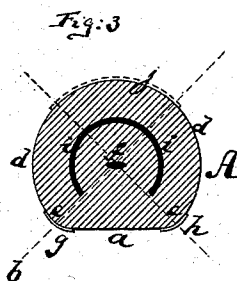
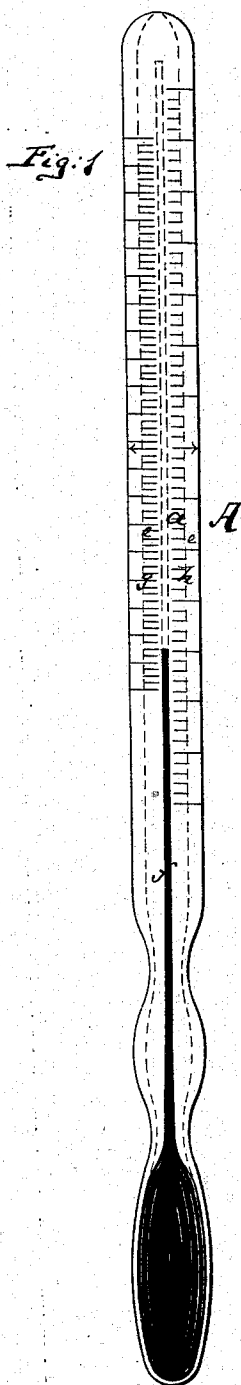


(Model.)

H. WEINHAGEN.
THERMOMETER.

No. 278,380.

Patented May 29, 1883.



Witnesses:
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UNITED STATES PATENT OFFICE.

HENRY WEINHAGEN, OF HOBOKEN, NEW JERSEY.

THERMOMETER.

SPECIFICATION forming part of Letters Patent No. 278,380, dated May 29, 1883.

Application filed February 8, 1883. (Model.)

To all whom it may concern:

Be it known that I, HENRY WEINHAGEN, of Hoboken, in the county of Hudson and State of New Jersey, have invented an Improved Thermometer, of which the following is a specification.

Figure 1 is an elevation of my improved thermometer seen from its flat side *a*, Fig. 3. Fig. 2 is an elevation of the instrument when looked at in the direction of the dotted line *b f*, Fig. 3. Fig. 3 is a cross-section, on an enlarged scale, of the instrument. Figs. 4 and 5 are similar sections of modifications of the instrument.

The object of this invention is to produce a magnifying-thermometer on which the mercury column and the scale will be superposed, and near the edge of the enamel reflector, so as to be perceived at a glance in the same row or line, which line at the same time is made the line of enlargement, so far as the appearance of the mercury column is concerned.

The invention consists in combining a flat-faced thermometer-tube with an inlaid enamel for the background, and in providing it with a scale at the junction of its convex and flat surfaces, all as hereinafter more fully described.

The invention also consists in providing both junctions of the flat side of the thermometer with the convex face with separate scales, and in so shaping the inlaid enamel as to be a reflector and an eye-guide for each of the scales, as hereinafter more fully described.

In the drawings, A represents a thermometer-tube made of glass, and made with a flattened face, *a*. By "flattened," in this connection, I mean a face either perfectly flat, as shown in Figs. 3, 4, and 5, or nearly so, or of any other suitable form, so long as it joins the convex portion *d* of the circumference of the thermometer-tube by one or more small curves, *e e*. The bore *f* of the tube is by preference elongated, as shown. There is a scale, *g*, at one junction of the flat side *a* with the convex side *d*, and there may be another scale, *h*, at the other junction of said flat and convex sides, as clearly shown in Fig. 3, the said scales being either one like the other or one different from the other, as may be desired. If they are alike, the instrument will be in proper position for observation, no matter how it happens to lie in the hand of the party using it. If

made with separate scales—such, for example, as Reaumur and Fahrenheit, or Fahrenheit and Celsius—the observation can be made on either of the scales, as may be most advantageous. In the body of the tube A, between its curvilinear circumference *d* and its bore *f*, is contained the enamel *i*, which is to constitute the reflecting-surface for the mercury column and the scale. This enamel is laid in preferably curvilinear form into the body of the glass, so as to extend nearly from the line *b f* to the line *h f*, as shown in Fig. 3; but it should not quite run to these lines. The said lines *b f* and *h f* are the lines of observation for the instrument. A glance at Fig. 3 will show that the enamel *i* will be a reflecting-body for the mercury column, and also for the corresponding scale, no matter which of the lines *b f* or *h f* is used as a line of observation at any one time. At the same time the enamel, coming very near to the line of observation, makes the use of the instrument convenient—that is to say, in magnifying-thermometers as they had heretofore been made it was usually a matter of greater or less difficulty to find the correct position for the observation of the instrument, so that the greatest enlargement of the mercury column would be realized. Persons handling these instruments were apt to waste much time in their endeavors to find the correct position for such inspection, and frequently they failed to find it at all, and had to use for their examination of the instrument the reduced appearance of the mercury column.

By the use of my improved thermometer as shown in Fig. 3 the inspector, holding the instrument in his hand, will examine it directly above the edge of the enamel *i*, and will at that place find the correct position for the examination of the instrument. In other words, when the instrument is held in the hand so that the mercury column is entirely concealed by the enamel, and then gradually turned so as to bring the edge of the enamel opposite the eye, the enlarged mercury column will appear to lie on the enamel, and will then be traversed by the corresponding scale, so that the examination of the instrument will be attended with no further difficulty; but, on the contrary, the mercury column will appear to be in a state of support on the enamel, and the difficult feat heretofore required of draw-

ing imaginary lines from that column to the gradations of the scale will be avoided. The result thus indicated, and which Fig. 2 is intended to show, will be the same whether the instrument is looked at on the line *b f* or on the line *h f*.

Although it is quite desirable to thus make a double instrument capable of use with a double scale, yet the main advantages of my invention will be enjoyed even where the instrument has but one scale, as indicated in Fig. 4, where the enamel *i* is carried beyond the line *h f*, so as to prevent the mercury column being seen on that line, allowing it to be only inspected on the line *b f*.

Fig. 5 shows a further modification of that which is indicated in Fig. 3, said modification consisting in a different form of enamel *i*, which difference in form, however, will, as is clear from an inspection of the drawings, produce no substantial difference in effect.

I desire to have it particularly understood that I regard it as a special advantage to place the enamel *i* as near to the mercury-bore *f* as possible, and as far away from the circumference of the glass as convenient, for it must be quite clear that the advantages of certainty of examination above alluded to are obtained by bringing the enamel as far into the interior of the instrument as possible. In order to make this quite clear, the lines *b f* and *h f* have been continued in Fig. 3 beyond the mercury-bore, and a curved dotted line, *j*, is drawn on the outer side of the instrument to indicate the place of the ordinary enamel backing, which place would be the correct one for observing the instrument from either scale *g* or *h*. It will at once be perceived that such an exterior back-

ing of enamel, in that it does not reach near to the lines *b f* and *h f*, deprives the observer of the facility of finding the enlarged appearance of the mercury column, which, with the interior enamel, *i*, is found by looking over the edge of the enamel. If, on the other hand, such outside enamel, *j*, should be carried close to the lines *b f* and *h f*, the result would be that the opportunity of lapping the scales *g h* over the angles of the instrument would be lost.

By "enamel reflector *i*" I mean a reflector made of any suitable material.

I claim—

1. In a thermometer having flat face *a* and curved face *d*, and scale *g* at the junction of said faces, the combination thereof with the enamel reflector *i*, which extends near to a line drawn from the bore of the instrument through the scale *g*, as specified.

2. A thermometer having scales *g h* at the junctions of its faces *a d*, and having inner bore, *f*, in combination with the enamel reflector *i*, which is interposed between the bore and the circumference of the thermometer, and extends from near the line that joins the bore with one scale to near the line that joins the bore with the other scale, substantially as described.

3. In a thermometer, the enamel reflector *i*, placed around the bore *f*, so as to embrace it on two sides and extend behind it, substantially as herein shown and described.

HENRY WEINHAGEN.

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