

(No Model.)

F. BRANDT.
THERMOMETER SCALE.

No. 478,984.

Patented July 19, 1892.

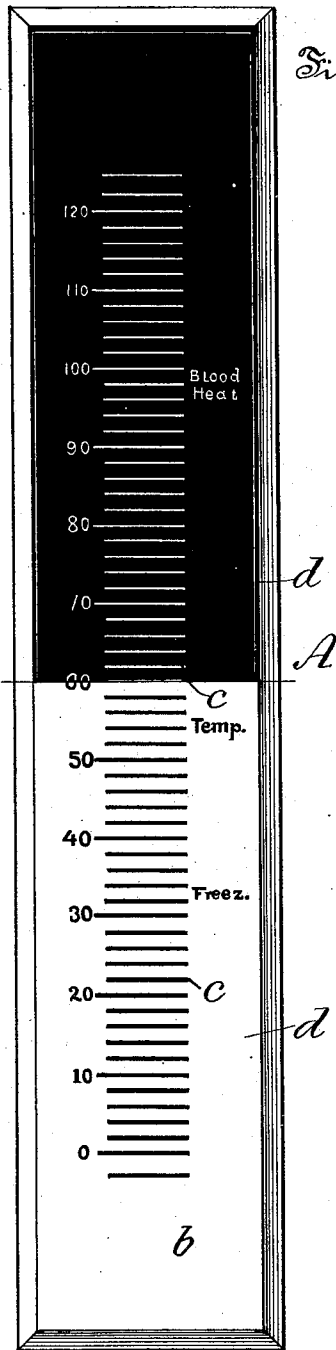


Fig. 1.

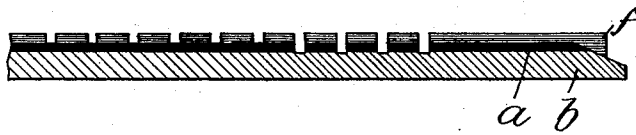


Fig. 2.

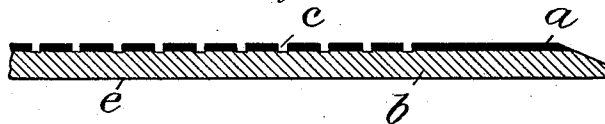


Fig. 3.

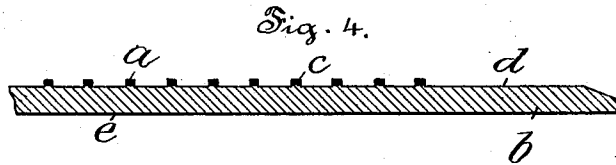


Fig. 4.

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UNITED STATES PATENT OFFICE.

FRANZ BRANDT, OF PHILADELPHIA, PENNSYLVANIA.

THERMOMETER-SCALE.

SPECIFICATION forming part of Letters Patent No. 478,984, dated July 19, 1892.

Application filed April 13, 1892. Serial No. 428,940. (No model.)

To all whom it may concern:

Be it known that I, FRANZ BRANDT, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and Improved Thermometer-Scales, of which the following is a specification.

My invention relates in general to thermometers, and more particularly to the construction and arrangement of the back plate or mounting with which the tube containing the mercurial or other sensitive fluid column is usually connected.

Hitherto it has been customary to provide the tube containing the mercurial or other sensitive column with a complemental scale for noting or registering the movements of the fluid column. In some cases this scale has been engraved upon the tube or upon the back plate or support. However, such a scale is not clearly discernable. This objection has in part been overcome by painting the scales either with or without previously engraving them. However, such painting is expensive and is obliterated in a short time by the action of heat, moisture, and acids, to which most, if not all, the thermometers are to a greater or less extent in use exposed.

The principal object of my present invention is to dispense with the employment of paint and other like pigments and to produce an inexpensive, attractive, and durable thermometer-scale that is contrasted in color with its background and is absolutely impervious to the destructive influences to which thermometers are generally exposed.

My invention consists of a composite thermometer-scale comprising superposed and united plates, sheets, or layers suitably contrasted in color and having portions of the exterior sheet, plate, or layer etched completely away to expose portions of an underlying sheet, plate, or layer, whereby the figures and background of the scale are strongly contrasted; and my invention further consists of the improvements hereinafter described and claimed.

The nature, scope, and general characteristic features of my invention will be more fully understood from the following description, taken in connection with the accom-

panying drawings, forming part hereof, and in which—

Figure 1 is a front elevation of a thermometer-scale embodying features of my invention and showing at the top thereof the graduations and accessories of a scale etched through a dark exterior plate, sheet, or layer and appearing upon a light interior plate, sheet, or layer, and also showing at the bottom thereof the graduations and their accessories produced in dark color by etching out the background in the dark exterior plate, sheet, or layer, and thus causing the same to appear upon a light interior plate, sheet, or layer. Fig. 2 is a sectional view illustrating the process of producing a thermometer-scale embodying features of my invention. Fig. 3 is a longitudinal central section of the upper portion of Fig. 1, showing the graduations and the accessories of the scale etched through the dark exterior plate, sheet, or layer and appearing on the light interior sheet, plate, or layer; and Fig. 4 is a similar view of the lower portion of Fig. 1, showing the background of the scale etched through the dark exterior plate, sheet, or layer and appearing on the light interior sheet, plate, or layer.

In the drawings, A is a composite thermometer-scale comprising two superposed and united plates, layers, or sheets *a* and *b*, suitably contrasted in color. In the present instance the sheet *a* is presumed to be composed of red glass and the sheet *b* of ground, clear, or transparent glass. However, any preferred materials or colors may be employed. These sheets, layers, or plates *a* and *b* may be superposed and firmly united together by heat and pressure or in any other preferred manner.

c are the graduations and accessories of the scale, and *d* is the background, and it is important that these two should be as strongly contrasted as possible in order to facilitate the operation of reading the thermometer. In my invention this result may be attained by etching the graduations and accessories *c* completely through the red glass *a*, so that they appear in white or transparent glass *b*, as shown at the upper portion of Fig. 1, or by etching the background *d* completely through the red glass *a*, so that it appears in white or transparent glass *b*, as shown at the lower por-

tion of Fig. 1. In either case the respective colors of the background and of the graduations are both permanent and the complete scale is exceedingly durable, because the colored-
 5 glass plates, sheets, or layers *a* and *b* are not in anywise affected by the destructive influences to which thermometers are in practice exposed.

When clear glass is employed as a back-
 10 ground of the scale, as shown in Fig. 4, the rear face of the sheet, layer, or plate *b* is preferably ground or dulled, as at *e*, in order to make the background opaque, whereby the graduations and their accessories *c* are rendered more distinct than would be the case
 15 if they appeared upon a transparent-glass plate, sheet, or layer *b*.

In order that the invention may be more fully understood, a brief description of a
 20 practically efficient method of producing the hereinabove-described thermometer-scale will now be given.

The red plate, sheet, or layer *a* and the transparent plate, sheet, or layer *b* are united
 25 by fusion and rolling or in any other preferred manner to form the composite thermometer-scale *A*. One surface of this scale is then coated with wax, asphalt, and oil or other acid-resisting material *f*, and the graduations and their accessories *c* or the back-
 30 ground *d*, according as the one or the other is required to appear in white in the finished article, are drawn upon the coated face of the scale *A* by the removal of corresponding portions of the wax or other acid-resisting material, as shown at the left-hand portion of Fig.
 35 2. The scale is then subjected to the action of fluohydric acid and camphor or other suitable materials that will attack glass and not the wax or other acid-resisting material in
 40 the usual manner. Of course care should be exercised to permit the acid to etch its way completely through the exposed portions of

the plate, layer, or sheet *a*, so that the sheet, layer, or plate *b* is exposed to view, as is illus- 45 trated at the right-hand portion of Fig. 2. The etched scale *A* is then suitably washed, and after being supplied with a thermometer bulb and tube (not shown) is ready for use. If required, the rear face of the scale *A* may 50 be ground by means of a sand-blast, or by exposure to the fumes of fluohydric acid, or in any other preferred manner.

It may be remarked that a scale embodying features of my invention may be produced 55 upon the glass tube of the thermometer or upon other instruments of precision, as barometers. Hence I do not limit myself to the exact construction and arrangement hereinbefore explained, and illustrated in the draw- 60 ings; for,

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

1. A panel for thermometers, composed of 65 composite or flashed glass and having on its face an etched scale, substantially as and for the purposes set forth.

2. A panel composed of composite or flashed glass and adapted for the reception of a ther- 70 mometer-tube and having on its back a ground-glass surface and having on its face an etched scale, substantially as and for the purposes set forth.

3. A panel composed of etched composite 75 material, as flashed glass, for holding a thermometer tube and bulb, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my signature in the presence of two subscribing 80 witnesses.

FRANZ BRANDT.

Witnesses:

THOMAS M. SMITH,
 RICHARD C. MAXWELL.